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STEEL

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FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

Opportunity's Door Open

Editor's Note: From homeless immigrant boy lacking education and with the bitterness of his experiences in the World war still in his heart, up in 15 years to the position of general manager, Lincoln Engineering Co., Detroit, is the story of Jonathan Kludt. In this autobiographical sketch he contrasts conditions and the opportunities for advancement in the United States with those in Europe. American workers at the bottom of the depression, he says, "were still better off than those in most European countries at the height of a boom."

To the Editor:

I was born in January, 1902, "somewhere" in Germany. Mother died when I was two; father was a lawyer, a busy man with no time for anything but business; so I was sent to live with friends in East Prussia.

At the beginning of the war I was taken prisoner by invading Russian Cossacks. I was then 12. And so, as a prisoner, I began a long journey to Russia. We rode for a month in box cars, 25 people to the car, 30 cars of prisoners. We slept on plank shelves. The journey was uneventful, for sleep was the only thing we could do, movement or exercise of any kind being impossible.

Horrors of Prison Camp

At my new "home" in Kamishin I found a barracks, a large hole in the ground with a roof, surrounded by an army of guards. Two shelves of boards bordering the room and a double-decked platform in the center constituted our beds. The only light was by oil lamps which smoked badly and stung our eyes. There was no heat; we had to keep warm by huddling together. There were no toilet facilities, no drinking water to speak of. The "soup wagon" came once a day to deliver a mixture of carrots, potatoes and

Jonathan Kludt

water, a monotonous diet day after day.

Being confined in these abominable quarters, many prisoners died each day. Finally, through the help of the Red Cross and the German consul some of us obtained a permit to go out on our own, providing we found jobs and would make daily reports to the Russian government.

I was in a new country, unable to speak the language, and with no parents; so I was fortunate to find a job in a sawmill about five miles outside the city limits on the Volga river. I had to awaken at 4 o'clock every morning in order to arrive at my job at 6. Work was not over until 6 in the evening, twelve hours of hard work even for a sturdy boy of 12. By the time I got home it was about 8 o'clock.

My work consisted mainly of wheeling sawdust and other menial tasks, for which I received compensation amounting to about 25 cents per day. Each day I was required to report to army authorities so they could keep a constant check on my whereabouts.

There was little opportunity for companionship with other boys my own age because I needed all the rest possible to be able to work the next day. The one thing I did have was time to think. In my long walks to and from work I had a chance to visualize and create in my mind a plan from which I could glean, if not a civilized living, at least my own soul-freedom.

The long trek to the sawmill was not on a paved sidewalk with electric illumination, it was not even a road. To one side, approximately 150 feet below, was the Volga river, at the other side a railroad track. There I first learned to "watch my step" and, if you watch your step, you have to think.

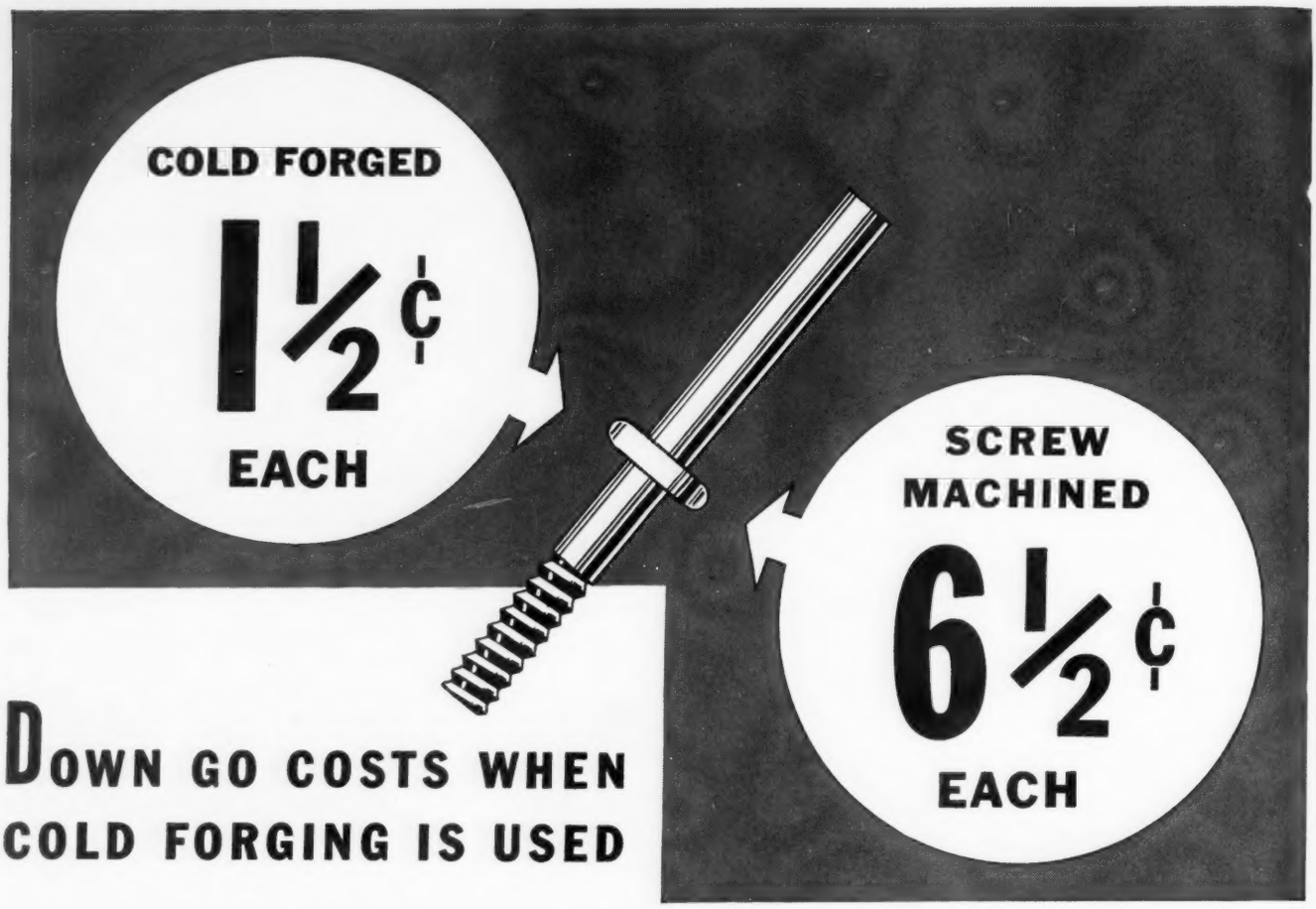
I was trying to conjure a way to earn an easier livelihood, but, being a prisoner in a strange country with no friends or parents to look after me, it seemed almost an impossibility.

Revolution Brought Release

The Russian revolution in 1917 provided an answer. After the Bolshevik coup, all prisoners were released, including those in jails, and the country became infested with every type of ruffian, and was the scene of the bitterest rioting and fighting.

In desperation, I determined to work my way back to Germany. I found bridges blown to pieces, highways torn to bits and impossible to travel. Taking to the woods and fields, I slept in farmers' barns, begged food from peasants, often did not see a piece of bread for

(*Please turn to Page* 72)



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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

Contents

Vol. 102-No. 11 **March 14, 1938**

READER COMMENTS 17

AS THE EDITOR VIEWS THE NEWS 21

NEWS
- Distribution of Finished Steel in 1937 23
- Penalty Tax on "Family" Firms Defeated 26
- Heavy Tax Burden Disclosed by Steel Financial Reports 27
- World's "Largest, Fastest" Continuous Strip Mill Opened 29
- How Railroad Freight Advance Affects Iron, Steel 30
- February Steel Ingot Output Up 8.9 Per Cent 31
- Steelworks Operations for the Week 31
- 20,000 See Tool Engineers' First Annual Exposition 32
- Meetings 32
- Men of Industry 36
- Obituaries 37

MIRRORS OF MOTORDOM 39

WINDOWS OF WASHINGTON 43

EDITORIAL—Steel Distribution Statistics May Be Made Even More Useful by Further Refinement 45

THE BUSINESS TREND
- Early March Signs Are Mildly Favorable 46
- Charts and Statistics 46-47

TECHNICAL
- Production of Wheeled Toys 48
- Experts Discuss Gas Sales Problems 58

PROGRESS IN STEELMAKING
- Lubrication of High-Speed Mills 50

MATERIALS HANDLING
- Use of Ram Trucks in Handling Coils 55
- Spring-Mounted Roller Conveyor 56

POWER DRIVES
- Power Correction 62
- New Principle in Design of Motor 64

METAL FINISHING
- New Bath Blanket 65

HELPFUL LITERATURE 73

WELDING, ETC.—*Robert E. Kinkead* 60

INDUSTRIAL EQUIPMENT 69

MARKET REPORTS AND PRICES 75
- The Market Week 76

BEHIND THE SCENES 86

CONSTRUCTION AND ENTERPRISE 97

INDEX TO ADVERTISERS 104

PRODUCTION · PROCESSING · DISTRIBUTION · USE

The aviator is part of a system in which nothing is left to chance. He has been trained to respect each detail. He works with men who are thinking things through. That's why his job has changed from an adventure to orderly routine.

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R36

As the Editor Views the News

■ IN THE light of recent agitation for lower prices on steel products, it is noteworthy that the iron and steel industry in 1937 (p. 27) returned about 7 per cent on capital invested. This compared with 10.7 per cent for industry in general and 20.3 for the automobile industry in particular. Net profits of 16 leading steel companies in 1937 were $193,477,377, an increase of 55.7 per cent over 1936. Average net profit per ton of ingots produced in 1937 was $4.68 compared with $3.25 in 1936. Approximately half the companies reporting were in the red in the last quarter. The steel industry staggers under a terrific tax burden. Leading producers in 1937 paid taxes aggregating more than half their net profits.

• • •

Steel, Tool Trades Gain

Stimulus to the purchase of shop equipment was provided (p. 32) at the machine and tool progress exposition held in Detroit last week in conjunction with the convention of the American Society of Tool Engineers. Representative exhibitors declared the show an unqualified success. Numerous orders for tools and equipment were placed. . . . Other favorable developments are reflected. While the railroads did not get the rate increases they had demanded, they did get relief (p. 30) to the extent of an average increase of 5 to 6 per cent. Railroad buying (p. 75) showed an encouraging increase during the past week. Due to purchases of steel scrap in the Chicago district, STEEL's composite of scrap prices (p. 76) is up for the first time since the middle of January.

• • •

Autos Lead Steel Users

For the seventeenth time (p. 23) STEEL presents the results of its annual survey of the distribution of steel by consuming classifications. The automobile industry in 1937, for the fifth consecutive year, was steel's best customer, taking 20.04 per cent of the total. Following next in order, with the percentages they absorbed, were buildings 12.32, railroads 11.74, containers 8.71, oil, gas and water 5.84, machinery, 4.88, agriculture 3.66, all other requirements 12.79. . . . In 1937 consumption of alloy steels the automotive industry (p. 26) ranked first with 59.63 per cent of the total. Following next in the percentage ranking were railroads 7.01, machine tools 6.75, agriculture 1.88, exports 1.69, oil 0.94, construction 0.74, shipbuilding 0.37, all other 20.94.

• • •

Galvanizing Loss Lowered

A standard straight wire galvanizing installation with exposure of 65 square feet accumulated 102,792 pounds of zinc oxide in one year's operation. This was nearly 10 per cent of the zinc purchased. To stop such oxide losses, as well as to reduce radiation losses, a new bath blanket (p. 65) has been developed. . . . Low power factor is a penalty on many plants. It may be raised (p. 62) by rearranging the loading on induction motors or by grouping machines so that a single motor drives several units. . . . New design features are embodied in a new 3-phase, alternating-current motor (p. 64) having speeds continuously variable from zero to maximum. Torque is constant throughout the speed range and motor speed practically independent of the load.

• • •

Steel in Wheel Toys

In grandfather's day wheeled toys for children were made largely of wood. Today they are of steel. Made in large volume and variety (p. 48) their production requires accurate press work. Model changes are frequent, necessitating extensive retooling programs. . . . Low viscosity lubricants with high film strength now are employed on high-speed mills (p. 50) to conduct away the heat developed by friction. . . . Use of ram trucks for handling strip steel in coil form has helped make the steel industry (p. 55) the best present customer for equipment of this type. . . . A number of interesting new developments (p. 66) are reflected in the field of metal finishing. . . . A new ball header (p. 69) cold forges steel balls for bearings from wire in coils.

E. L. Shaner

The New Era In Steel

In 1842, when Industry's problem was availability of steel, Ryerson built up large and complete stocks.

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Sharp Upturn in Exports Features

Finished Steel Distribution

■ ANALYSIS of finished rolled steel distribution for 1937 shows no change in the ranking of the four leading consumers.

The automotive group holds first place by a wide margin, having taken 20.04 per cent of the total. This is the fifth consecutive year in which the motor car industry's consumption has exceeded 20 per cent.

Buildings, including furniture, furnishings, stoves, refrigerators, etc., as well as erection materials, framework, trim, etc., rank second, having consumed 12.32 per cent of the total finished steel output. Railroads, with 11.74 per cent, are in third place—only slightly behind buildings.

Containers, which ranked third during several of the worst depression years, hold fourth place. This group consumed 8.71 per cent of the total.

Fifth place goes to a newcomer in the higher ranks of steel consumers. Exports, which for many years have trailed along in the lower brackets, leaps from seventh to fifth with 6.74 per cent. This is the highest percentage in any year since 1922, when STEEL's series of distribution figures was inaugurated. In that year exports accounted for 7.82 per cent of the total.

Other consuming groups, in order of rank, are the oil, gas and water group, 5.84 per cent; machinery, tools and equipment (including electrical), 4.88 per cent; agriculture implements and other agricultural uses, 3.66 per cent; highways and highway bridges, 1.14 per cent; shipbuilding and repair, 0.98 per cent; and mining, quarrying and lumbering, 0.55 per cent. Miscellaneous and unclassified tonnage accounted for 10.12 per cent.

A tonnage exclusive of the foregoing and representing 13.28 per cent of the total was distributed through jobbers and warehouses. This compares with 14.13 per cent in 1936. The trend of jobber consumption from 1926 to date, as shown in the table at the bottom of this page, suggests that the percentage of finished steel marketed through jobbers is highest in the severest years of depression and that it eases to slightly below the average in years of comparatively good demand.

The accompanying tables showing distribution by tonnage and by percentages are derived from reports from 85 companies. These include all of the integrated producers of important tonnage and most of the non-integrated mills which roll their product from purchased semifinished steel. Thus the tonnage reported to STEEL totals 32,695,349 gross tons, which compares with 32,878,270 gross tons reported in the production figures of the American Iron and Steel institute. (See p. 28, STEEL, Feb. 14, 1938. Total production of 37,945,108 minus 5,066,818 of semifinished equals

Per Cent of Finished Rolled Steel Taken by Principal Consuming Groups

	1937	1936	1935	1934	1933	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923
Automotive ...	20.04	20.87	24.04	20.87	20.95	18.15	14.78	14.10	17.57	17.76	13.34	15.09	14.60	11.37	10.59
Buildings	12.32	13.87	13.01	12.70	12.18	16.38	16.80	17.80	14.70	15.22	14.89	13.10	15.26	14.44	13.53
Railroads	11.74	11.33	7.75	12.96	8.04	9.09	14.65	16.95	18.44	17.02	20.37	22.81	22.26	27.54	31.02
Containers ...	8.71	8.44	9.30	8.68	12.25	10.79	7.90	5.77	4.67	4.56	5.21	5.24	4.20	4.96	3.68
Exports	6.74	3.79	3.85	5.29	3.61	3.31	4.10	4.34	4.83	5.52	5.39	5.29	4.47	5.89	6.22
Oil, gas, water	5.84	5.33	4.29	4.97	4.88	5.50	9.75	9.48	9.01	7.72	8.90	9.29	8.03	8.43	10.60
Machinery ...	4.88	4.96	4.37	3.65	3.63	3.39	3.37	3.80	3.81	3.48	2.79	2.65	2.69	3.69	2.63
Agriculture ...	3.66	3.57	4.74	2.42	3.01	2.76	3.56	4.51	5.27	6.34	4.42	2.70	3.02	3.54	2.34
All other	12.79	13.71	14.22	14.44	16.54	14.51	12.41	11.04	10.65	11.60	11.87	13.31	25.47	20.14	19.39
Total	86.72	85.87	85.57	85.98	85.09	83.88	87.32	87.79	88.95	89.22	87.18	89.48	100.00	100.00	100.00
Jobbers	13.28	14.13	14.43	14.02	14.91	16.12	12.68	12.21	11.05	10.78	12.82	10.52	.....	.....	.....
Grand total.	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Distribution of Finished Steel in Per Cent to Consuming Groups

	Rails heavy and light	Angle bars, steel ties and other track accessories	Plates	Structural shapes over 3 inch	Bars, except concrete bars, and shapes under 3 inch	Concrete bars	Black plate for tinning	All other black plate and sheets except galv. sheets	Galvanized sheets	Strip steel	Tubing and pipe	Wire products	All other finished steel products
1—Railroads													
a Cars and locomotives	0.07	4.75	21.07	12.03	6.43	0.01	0.01	2.61	3.12	1.90	1.37	1.06	24.52
b Track construction and repair	86.38	83.23	0.34	0.06	0.71	0.39	.....	0.25	0.40	0.06	0.02	0.47	2.37
c Buildings and bridges	0.58	0.25	1.48	2.95	0.48	1.04	.....	0.08	0.98	0.10	0.05	0.26	0.19
2—Buildings													
a Erection materials, framework, trim, etc.	0.03	0.06	10.53	44.62	5.05	34.37	0.08	2.92	4.42	2.30	0.84	5.61	1.89
b Furnishings, furniture, stoves, refrigerators, etc.	....	.....	0.79	0.23	1.49	0.04	0.55	10.49	3.72	4.23	0.43	4.65	0.74
c Other miscellaneous products for buildings	....	.....	2.64	1.68	1.09	0.70	0.55	1.49	6.69	1.52	2.70	1.02	0.39
3—Highways and highway bridges	....	.....	0.83	2.28	0.31	13.72	.....	0.25	5.89	0.10	.....	2.61	1.66
4—Automotive	....	0.03	2.91	1.01	34.88	0.02	0.16	44.88	0.45	55.33	1.70	7.78	7.33
5—Oil, gas and water	0.01	0.10	5.04	1.88	0.85	2.11	1.34	1.08	0.23	0.08	45.17	0.98	1.04
6—Mining, quarrying, lumbering	2.46	1.82	0.93	0.57	0.57	0.70	.....	0.17	0.24	0.06	0.15	0.97	2.13
7—Agricultural													
a Implements	....	.....	2.24	2.14	9.98	0.05	0.01	1.40	3.87	4.82	0.18	2.45	0.61
b Other agricultural uses	....	.....	0.34	0.08	0.13	0.64	0.04	0.50	0.81	0.52	0.03	7.83	0.76
8—Shipbuilding and repair	0.01	0.01	6.78	1.88	0.80	0.02	.....	0.08	0.22	0.02	0.21	0.40	0.60
9—Machinery, tools, equipment (including electrical)	0.16	0.04	8.44	5.64	9.00	1.72	0.14	5.78	1.37	4.39	3.86	3.25	4.74
10—Food and packing industry (all containers)	....	.....	0.73	0.04	0.17	.....	77.33	7.96	1.90	2.94	0.01	1.11	13.84
11—Exports	7.18	2.99	14.58	5.51	2.84	5.88	15.95	5.13	6.65	2.42	4.85	5.48	15.98
12—Miscellaneous	1.96	4.05	12.00	6.06	16.56	12.15	2.26	7.23	7.03	16.40	6.09	20.41	14.22
Jobbers	1.16	2.67	8.33	11.34	8.66	26.44	1.58	7.70	52.01	2.81	32.34	33.66	6.99
Grand totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Distribution of Finished Steel in Gross Tons to Consuming Groups

	Rails, heavy and light	Angle bars steel ties and other track accessories	Plates	Structural shapes over 3 inch	Bars except concrete bars, and shapes under 3 inch	Concrete bars	Black plate for tinning
1—Railroads							
a Cars and locomotives	1,049	28,908	642,956	296,626	303,571	87	395
b Track construction and repair	1,233,741	507,145	10,265	1,373	33,257	3,104	79
c Buildings and bridges	8,285	1,525	45,292	72,852	22,478	8,357	.....
2—Buildings							
a Erection materials, framework, trim, etc.	481	392	321,383	1,100,156	238,477	276,534	2,115
b Furnishings, furniture, stoves, refrigerators, etc.	.....	.....	24,223	5,725	70,324	284	14,566
c Other miscellaneous products for buildings	.....	1	80,722	41,367	51,419	5,652	14,570
3—Highways and highway bridges	....	.....	25,214	56,139	14,562	110,396	.....
4—Automotive	2	184	88,775	24,927	1,646,262	190	4,214
5—Oil, gas and water	163	598	153,735	46,480	40,107	16,968	35,753
6—Mining, quarrying, lumbering	35,097	11,060	28,535	14,090	27,101	5,622	62
7—Agricultural							
a Implements	.....	27	68,330	52,668	470,904	359	155
b Other agricultural uses	.....	.....	10,264	2,012	6,328	5,168	1,050
8—Shipbuilding and repair	104	75	206,920	46,287	37,541	201	31
9—Machinery, tools, equipment (including electrical)	2,314	247	257,652	138,977	424,954	13,857	3,665
10—Food and packing industry (all containers)	.....	.....	22,142	975	8,201	.....	2,061,892
11—Exports	102,478	18,209	444,869	135,946	133,871	47,326	425,201
12—Miscellaneous	28,042	24,691	366,372	149,335	781,626	97,722	60,246
Totals	1,411,756	593,062	2,797,649	2,185,935	4,310,983	591,827	2,623,994
Jobbers	16,492	16,260	254,271	279,691	408,938	212,753	42,274
Grand totals	1,428,248	609,322	3,051,920	2,465,626	4,719,921	804,580	2,666,268

	All other black plate and sheets except galv. sheets	Galvanized sheets	Strip steel	Tubing and pipe	Wire products	All other finished steel products	Grand totals	Per cent of total
1—Railroads								
a Cars and locomotives	165,284	40,499	56,723	45,779	22,766	203,050	1,807,693	5.53
b Track construction and repair	15,862	5,211	1,675	589	10,097	19,631	1,842,029	5.63
c Buildings and bridges	5,054	12,760	2,886	1,635	5,665	1,581	188,370	0.58
2—Buildings								
a Erection materials, framework, trim, etc.	185,091	57,445	68,861	28,313	120,270	15,631	2,415,149	7.39
b Furnishings, furniture, stoves, refrigerators, etc.	664,555	48,329	126,585	14,477	99,778	6,118	1,074,964	3.29
c Other miscellaneous products for buildings	94,540	86,962	45,423	90,373	21,985	3,201	536,215	1.64
3—Highways and highway bridges	15,993	76,615	3,142	90	55,938	13,775	371,864	1.14
4—Automotive	2,844,752	5,883	1,653,681	57,016	166,885	60,735	6,553,506	20.04
5—Oil, gas and water	68,386	2,953	2,382	1,512,709	21,126	8,719	1,910,079	5.84
6—Mining, quarrying, lumbering	10,407	3,065	1,815	5,166	20,827	17,623	180,470	0.55
7—Agricultural								
a Implements	88,854	50,347	144,041	5,948	52,653	5,040	939,326	2.87
b Other agricultural uses	31,796	10,599	15,458	1,202	167,897	6,300	258,074	0.79
8—Shipbuilding and repair	5,350	2,821	620	6,905	8,656	4,949	320,460	0.98
9—Machinery, tools, equipment (including electrical)	366,018	17,778	131,244	129,316	69,696	39,221	1,594,939	4.88
10—Food and packing industry (all containers)	504,642	24,659	87,764	180	23,783	114,598	2,848,836	8.71
11—Exports	325,336	86,378	72,242	162,332	117,566	132,290	2,204,044	6.74
12—Miscellaneous	458,351	91,367	490,061	203,980	437,903	117,779	3,307,425	10.12
Totals	5,850,271	623,671	2,904,603	2,265,960	1,423,491	770,241	28,353,443	86.72
Jobbers	488,267	675,891	83,887	1,082,998	722,287	57,897	4,341,906	13.28
Grand totals	6,338,538	1,299,562	2,988,490	3,348,958	2,145,778	828,138	32,695,349	100.00

32,878,270 gross tons of finished steel.)

For the benefit of those who note seemingly serious discrepancies between the ranking of the four leading consumers reported by STEEL and that reported by another publication, it should be explained (p. 45) that different classification groups are employed.

"Buildings" in STEEL'S classification includes three sub-classifications: (a) erection materials, framework, trim, etc.; (b) furnishings, furniture, stoves, refrigerators, etc. and (c) other miscellaneous products for buildings. In the other publication, "Buildings" includes only (a) fabricators and contractors and (b) building trim manufacturers. These are roughly comparable to STEEL'S sub-classification "(a) erection materials, framework, trim, etc."

Therefore, if sub-classifications "b" and "c" are removed from "Buildings" in STEEL'S tabulation, the ranking of the first four consumers will agree with that of the other publication. Conversely the addition of furnishings, household equipment etc. to its "Building" classification will make its ranking correspond to STEEL'S.

In previous years, STEEL'S distribution figures were based upon actual shipments for 11 months and estimated figures for the month of December. This year, by withholding the compilation until after the close of the year, it was possible to base the figures upon the actual shipments for the entire year.

Alloy Figures More Complete

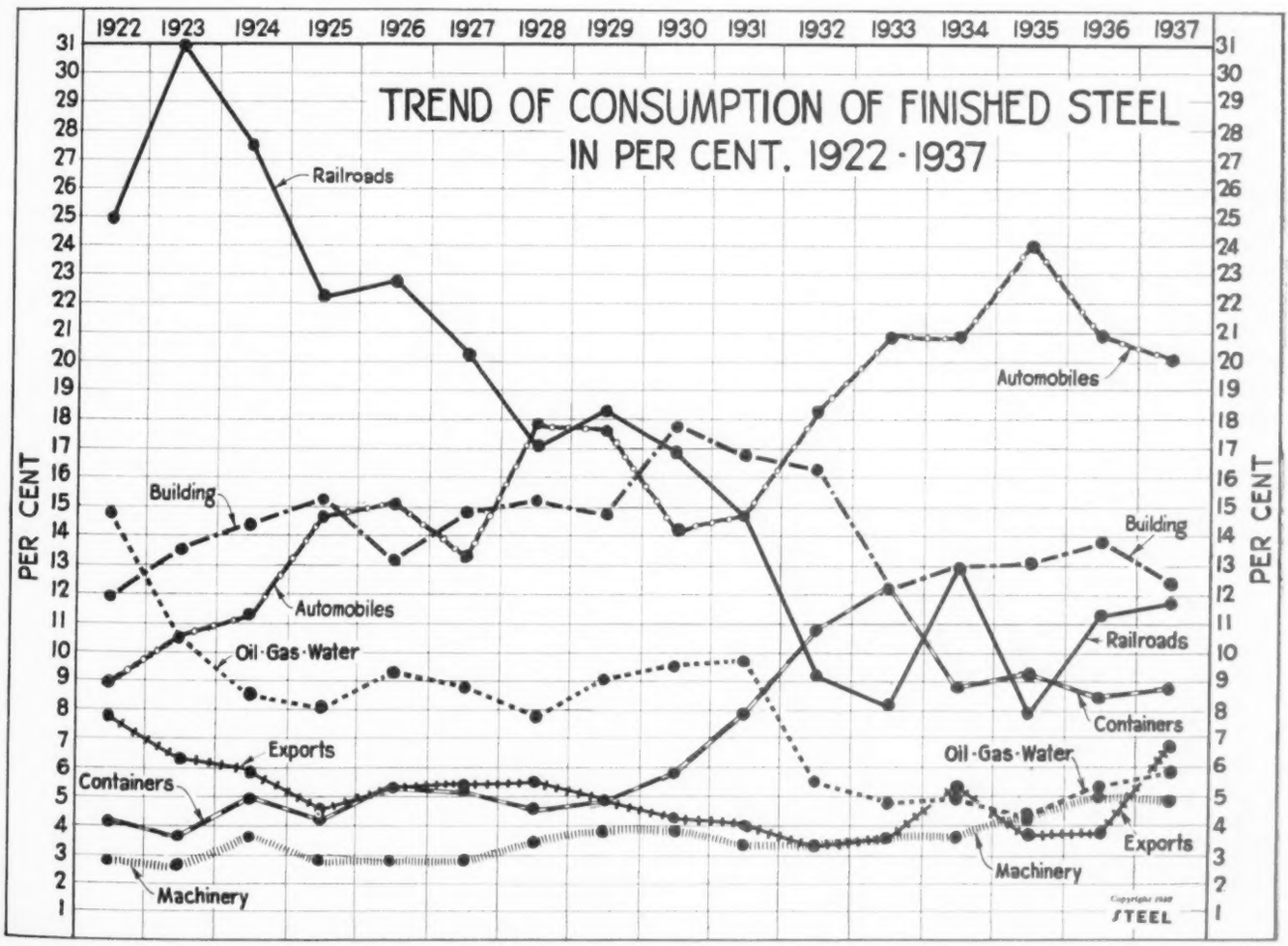
No significant shifts in trends in distribution of alloy steel were discernible from the tonnages reported for 1937. The automotive industry continued to hold its dominant position as the principal consumer, its proportion varying little from that for 1936. Railroads remained in second place and the machine tool industry in third. Agriculture took a smaller proportion of the total, but held to fourth position nevertheless.

Figures for 1937 undoubtedly afford a more accurate analysis of alloy steel distribution than those reported by STEEL in the past because of the fact that a larger number of companies producing alloy steel made their tonnages available. Total tonnage reported in 1937 was 979,013 gross tons, this being 289,232 tons, or 42 per cent, more than the 1936 total of 689,781 tons.

In spite of this, however, the figures on alloy steel distribution must be considered indicative rather than conclusive, for returns are not yet thoroughly representative of the alloy steel industry. More complete returns probably would show greater diversity in distribution, possibly at the expense of the automotive industry's proportion.

According to the 1937 reports to STEEL, the automotive industry accounted for 59.68 per cent of the alloy steel total, as compared with 59.78 per cent in 1936. Inasmuch as the 1936 percentage had dropped from 72.22 per cent in 1935, it had been anticipated that the 1937 figures would continue this trend. Instead, the drop between 1936 and 1937 was insignificant. The average of automotive for the seven years, 1929-1935, was 66.82 per cent.

The railroad industry took 7.01 per cent of the alloy steel total in 1937, against 6.96 per cent in 1936. The machine tool industry consumed 6.75 per cent of the 1937 tonnage, compared with 6.57 per cent in 1936. Agricultural industry dropped from 3.03 per cent in 1936 to 1.88 per cent last year. Exports in 1937, with 1.69 per cent, increased somewhat and ranked ahead of the oil industry. The construction industry made a small gain in 1937 and



Use of Alloy Steel, by Consuming Industry, 1929-1937

Group	Gr. Tons Reported 1937	Percentage of Consumption by Groups 1937	1936	1935	1934	1933	1932	1931	1930	1929
Automotive	584,284	59.68	59.78	72.22	53.31	68.28	77.64	72.67	62.23	61.40
Machine tools	66,097	6.75	6.57	4.47	4.88	3.57	3.54	6.17	8.95	6.34
Railroads	68,660	7.01	6.96	2.30	4.11	0.92	1.92	1.83	2.66	1.02
Agricultural	18,424	1.88	3.03	2.87	2.42	2.07	1.69	3.30	5.94	4.05
Construction	7,206	0.74	0.45	0.94	1.55	0.66	0.68	1.09	1.00	3.72
Shipbuilding	3,627	0.37	0.44	0.39	1.21	0.47	0.42	0.52	0.79	0.22
Oil industry	9,182	0.94	1.07	1.77	1.52	1.96	0.82	1.16	4.73	4.07
Exports	16,547	1.69	1.00	0.58	0.58	0.29	0.43	0.88	1.16	1.38
Miscellaneous	204,986	20.94	20.70	14.46	30.42	21.78	12.86	12.38	12.54	17.80
Totals	979,013	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

shipbuilding a slight loss, but their relative positions remained unchanged.

As has been the case in past years, an overwhelming proportion of alloy steel production is distributed in the form of hot rolled bars, nevertheless, this product showed a loss of 2.56 per cent—from 77.32 per cent in 1936 to 74.76 per cent in 1937. Hot rolled bars accounted for 731,880 tons of the 979,013 tons reported.

Alloy steel forgings increased from 0.31 per cent in 1936 to 5.30 per cent in 1937. The forgings' average for the past eight years was 2.19 per cent. Undoubtedly consumption of forgings did increase in the past year, but probably part of the reported increase is due to greater accuracy in the statistics because of more complete returns.

Increases were found in cold drawn alloy bars, sheets, plates, cold rolled strip and tool steel; losses were noted in pipe and tubes, wire, structural shapes and hot rolled strip.

Steel Products Denies Withdrawing from Mexico

■ United States Steel Products Co., export subsidiary of United States Steel Corp., last week denied a report it would withdraw from Mexican operations. A suspension is said to be only temporary and pends determination of the best method of doing business in conformity with Mexican laws. Since the middle of last year these laws have called for a 3 per cent import surtax.

Kill Penalty Tax On Family Firms

■ PRESIDENT Roosevelt's pet plan for imposing a 20 per cent penalty tax on family, or closely held, corporations was rejected last week by a house of representatives in rebellion. The vote was 180 to 124.

Defying probable political reprisals, many Democrats joined with Republicans in defeating the bill which obviously would have imposed a heavy burden on thousands of companies. Many of the companies hurt would have been of small and moderate size.

The proposed tax would have applied to corporations reporting net profits of $75,000 or more and in which ownership is distributed as follows:

One individual or family owning more than 50 per cent; two individuals or families owning more than 53 per cent; three with more than 56 per cent; four with more than 59 per cent; five with more than 62 per cent; six with more than 65 per cent; seven with more than 68 per cent; eight with more than 71 per cent; nine with more than 74 per cent or ten with more than 75 per cent.

Reluctantly the administration abandoned the plan following the coalition rebellion, the second of the present session.

Administration leaders in the house had passed out the word that the penalty tax was the one real "must" on the President's program in the tax revision bill. Presidential veto of the whole bill was hinted if the penalty tax were not included.

Opposition to the tax was led by Representative John W. McCormack, Massachusetts Democrat. On the floor he pointed out that the proposed tax was wholly discriminatory.

Use of Alloy Steel, by Finished Form, 1929-1937

Product	Gr. Tons Reported 1937	Percentage of Consumption by Products 1937	1936	1935	1934	1933	1932	1931	1930	1929
Hot rolled bars	731,880	74.76	77.32	84.62	68.73	69.81	77.28	54.48	70.50	61.87
Cold drawn bars	25,795	2.64	2.54	4.32	14.99	19.05	11.68	25.65	5.32	11.43
Sheets	34,851	3.56	3.41	2.03	10.20	1.29	1.14	0.69	0.94	11.03
Plates	29,091	2.97	1.76	0.78	1.28	0.59	0.65	1.95	3.05	1.04
Pipe and tubes	9,023	0.92	1.11	0.78	1.75	3.57	4.80	8.60	8.84	6.33
Structural shapes	13,194	1.35	1.73	0.31	0.19	0.01	0.12	0.07	0.42	0.12
Wire	6,963	0.71	1.57	1.15	0.25	0.33	0.28	0.06	0.08	0.05
Hot rolled strip	40,529	4.14	6.91	5.01	0.49	2.88	0.66	1.31	3.86	4.43
Cold rolled strip	6,598	0.67	0.46	0.38	0.35	0.51	0.43	0.04	0.06	0.09
Tool steel	29,194	2.98	2.88	0.42	1.60	0.48	1.07	2.03	0.80	1.36
Forgings	51,895	5.30	0.31	0.20	0.17	1.48	1.89	5.12	6.13	2.25
Totals	979,013	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Authorize Liquidation Of Reading Iron Co.

■ Liquidation of the Reading Iron Co., Reading, Pa., the last company in the country to produce hand-puddled wrought iron pipe, was authorized last week by stockholders. Liquidation will proceed in an orderly manner and the plant will continue to operate as long as it has raw material, according to M. P. McDermott, vice president and secretary.

All stock in the company is owned by the Philadelphia & Reading Coal & Iron Co. Reading Iron Works, as it was first known, was built in 1836, operated puddling furnaces, produced wrought iron tubes, sheets, bars, cut nails and similar products. Incorporated with $1,000,000 under Pennsylvania laws in 1889, the company expanded to acquire ore and coal properties, blast furnaces and several mills. In recent years, the company had disposed of or abandoned many of its properties.

Distribution by Percentage of Alloy Steel in 1937

Shown by Consuming Groups and Individual Products

Group	Hot rolled bars	Cold drawn bars	Sheets	Plates	Pipe and tubes	Wire	Structural shapes	Hot rolled strip	Cold rolled strip	Tool steel	Forgings
Automotive	66.16	27.85	3.01	1.51	0.56	8.96	0.10	80.31	17.47	29.97	93.08
Machine tool	7.44	6.08	3.63	3.76	0.47	4.25	1.81	2.45	2.26	16.65	2.16
Railroad	2.03	0.22	51.48	62.60	0.02	0.22	92.34	11.72	0.08	1.79	0.23
Agricultural	2.28	1.58	0.33	0.13	..	5.31		0.10	0.08	2.57	..
Construction	0.31	0.02	1.49	3.86	0.73	2.36	2.10	0.29	0.58	8.20	0.49
Shipbuilding	0.09	0.13	0.80	2.76	3.41	0.04	0.93	0.03	0.01	4.07	0.36
Oil industry	0.93	2.07	0.01	0.05	8.62	0.03	0.02	..		3.67	
Exports	1.62	2.48	5.13	1.85	7.37	0.36	1.38	1.08	4.23	0.31	0.08
All other	19.14	59.57	34.12	23.48	78.82	78.47	1.32	4.02	75.29	32.77	3.60
Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Steel Earnings Up 55.7 Per Cent; Taxes More Than Half of Net Profits

■ NET profits for 1937 reported by 16 leading steel producers, representing 58,542,400 gross tons of ingot capacity, or 85.6 per cent of the country's total, totaled $193,477,377. This is 55.7 per cent more than the $124,264,163 net profit for the identical 16 in 1936.

On this basis, the indicated net for the entire industry in 1937, with an average total ingot capacity for the year of about 68,388,112 gross tons, was $231,850,300.

Production of steel ingots in 1937 amounted to 49,507,766 gross tons, 5.8 per cent more than 46,807,780 tons in 1936. Steelworks operations as reported by the American Iron & Steel institute, averaged 72.3 per cent in 1937 and 68.3 per cent in 1936.

Indicated average profit per ton of ingots produced by the industry in 1937 was $4.68, against $3.25 the preceding year.

Net profit of 14 companies whose figures are available for the fourth quarter of 1937, total $10,601,641. This compares with $47,456,748 for the same 14 in the fourth quarter of 1936, a decline of approximately 77.6 per cent.

Contrasted with the fourth quarter of 1936—when all producers made substantial profits—approximately half the companies which so far have reported were in the red in the same period in 1937.

From reports of those companies which so far have issued pamphlet statements giving details—this list including a half dozen of leading steel producers—it is apparent taxes they paid in the aggregate last year were equivalent to more than half of their net profits. Including payments made under the social security act, which some companies consider as tax, their total payments are equal to about 67 per cent of their net profits.

Estimated individual profit per ton, based on each company's ingot capacity:

	1937	1936
National Steel Corp.	$6.59	$4.64
Inland Steel Co.	5.41	5.50
Youngs. Sheet & Tube Co.	3.90	3.39
U. S. Steel Corp.	3.88	1.97
Bethlehem Steel Corp.	3.40	1.49
Sharon Steel Corp.	2.99	2.83
Continental Steel Corp.	2.91	2.63
Wheeling Steel Corp.	2.42	2.35
Laclede Steel Co.	1.94	0.17
Republic Steel Corp.	1.40	1.58
Jones & Laughlin Steel Corp.	1.31	1.13
Pittsburgh Steel Co.	0.91	*0.37
Colorado Fuel & Iron Corp.	0.81	2.28
Lukens Steel Co.	0.21	0.15
Rustless Iron & Steel Corp.†	31.00	15.22
Ludlum Steel Co.§	29.47	27.39

*Loss. †Stainless steel. §Special alloy and tool steel.

IRON AND STEEL PROFITS TRAIL INDUSTRIAL AVERAGE

Profits of 37 companies in its "iron and steel" classification gained sharply in 1937 but return on investment lagged behind the average for all industries, according to a survey by the National City Bank of New York.

Net profits for the 37 was $206,025,000 in 1937, compared with $130,527,000 in 1936, an increase of 57.8 per cent. Return on investment in 1937 averaged 7 per cent, against 4.5 per cent in the preceding year.

Average return to 1020 companies in various industries was 10.7 per cent in 1937, against 10.1 per cent in 1936. The 7 per cent profit to the iron and steel companies compares with 20.3 per cent for 15 automobile companies; 15.7 per cent for 12 chemical companies; 15 per cent for 26 hardware and tool companies; 15.8 per cent for 49 machinery companies.

Fourth quarter profits of the iron and steel companies dropped 91.5 per cent in 1937 from 1936.

U. S. STEEL CORP. TAXES INCREASE $35,897,292

United States Steel Corp. reports net income for 1937, after federal surtax on undistributed profits, of $94,944,358, compared with $50,583,356 in 1936, in its annual pamphlet to stockholders.

These earnings were sufficient to permit payment of the remaining arrearages on the preferred stock ($9.25 a share), and the continuance of regular dividends on preferred stock at $7 a share. It also permitted a dividend of $1 on common stock, the first since March 30, 1932. Dividend declarations in 1937 totaled $67,248,930.75.

The corporation's financial position as of Dec. 31, 1937, is shown in the following table. Net working assets are stated after deduction of declared dividends which do not become due and payable until after the close of the year.

Tax bill of the corporation for 1937 totaled $88,048,237, compared with $52,150,945 in 1936, an increase of $35,897,292. Social security taxes for 1938 and succeeding years will be further increased by the progressively higher rates which are provided under state and federal security tax enactments.

Expanding business demands early in 1937 at times heavily taxed production facilities. Operations in rolled and finished steel products for sale averaged 71.2 per cent for the year, against 59.3 per cent in 1936. During the first quarter operations were 82.6 per cent; in the second quarter, 88.4 per cent; in the

Steel's Fourth Quarter and Annual Earnings Compared

	Fourth quarter 1937	Fourth quarter 1936	Year, 1937	Year, 1936	Ingot Capacity Gross tons
United States Steel Corp.	$4,577,983	$20,923,995	$94,944,358	$50,583,356	25,772,400
Bethlehem Steel Corp.	4,253,375	5,291,492	31,819,596	13,901,006	9,360,000
Republic Steel Corp.	*247,323	3,253,273	9,044,147	9,586,922	6,452,000
Jones & Laughlin Steel Corp.	*1,173,591	2,076,280	4,788,799	4,129,600	3,660,000
Youngs. Sheet & Tube Co.	1,696,022	3,719,115	12,190,649	10,564,501	3,120,000
National Steel Corp.	2,580,925	4,628,729	17,801,892	13,171,148	2,700,000
Inland Steel Co.	867,571	3,867,625	12,665,317	12,888,647	2,340,000
Wheeling Steel Corp.	*763,545	2,046,529	4,238,488	4,115,388	1,750,000
Colorado Fuel & Iron Corp.	*491,019	108,263	718,989	2,029,305	888,000
Lukens Steel Co.§	.....	.....	158,218	112,205	754,000
Pittsburgh Steel Co.	*420,439	261,870	657,272	*265,360	720,000
Sharon Steel Corp.	*300,796	482,482	1,345,810	1,272,246	450,000
Continental Steel Corp.	21,041	338,766	814,553	736,228	280,000
Laclede Steel Co.	.....	.....	455,729	40,656	235,000
Ludlum Steel Co.	*80,775	335,895	1,120,422	1,041,245	‡38,000
Rustless Iron & Steel Corp.	82,212	122,434	713,138	357,070	†23,000
TOTALS	$10,601,641	$47,456,748	$193,477,377	$124,264,163	58,542,400
FINISHING CAPACITY ONLY					
Acme Steel Co.	*$171,341	$711,022	$1,898,904	$2,157,677	.....
Superior Steel Corp.	*70,736	256,798	239,526	454,943	.....
PIG IRON CAPACITY ONLY					
Virginia Iron, Coal & Coke Co.	*$12,119	*$18,963	*$88,271	*$88,404	200,000

*Loss. †Stainless steel ingots. ‡Special alloy tool steel. §Fiscal year ending Oct. 16.

third, 73.6; and in the fourth 40.6 per cent.

Annual capacities of subsidiaries in the following lines of production Jan. 1, 1938 were:

	Tons
Blast furnace, pig iron, spiegel and ferromanganese	20,470,000
Steel ingots and castings	25,790,000
Rolled and finished steel products for sale	18,114,000

Shipments of all classes of products in 1937 compared with shipments during the preceding year were as follows:

	Tons	
	1937	1936
Rolled and finished steel products	12,748,354	10,784,273
Pig iron, ingots, ferro and scrap	1,025,355	763,257
Limestone, coal, coke and iron ore	3,724,480	3,057,383
Sundry materials and by-products	527,106	417,093
Total (ex. cement)	18,025,295	15,022,006

Total dollar business amounted to $1,395,549,630, compared with $1,083,337,435 in 1936.

Employment during the major part of the year continued on a substantially larger and more widespread scale than for some years past. Peak employment was reached in August with 278,000, probably an all-time high. Low point of the year came in December when the number of the payroll was 236,000, of whom many were on part time.

	Dec. 31, 1937	Dec. 31, 1936
Gross working assets, incl. cash, receivables, inventories, etc.	$483,414,682	$488,583,356
Current accounts payable	117,331,071	103,557,709
Net wrkg. assets	$366,083,611	$385,025,647

SHEET & TUBES NET SALES UP 13 PER CENT IN 1937

Youngstown Sheet & Tube Co.'s net sales for 1937 exceeded those of 1936 by 13 per cent, according to the company's annual report. The 1937 net sales were $144,288,797, compared to $127,674,517 for 1936.

Improvements and additions completed last year totaled $13,697,004 and improvements already authorized but yet uncompleted total $2,800,000. Those completed or now under way include an additional cold reducing unit, revamping of a large seamless tube mill, two heavy high-speed piercing mills, an increase in boiler plant capacity, an intermediate blooming mill, and other items at the company's Youngstown plants; and an additional cold reducing tin plate mill, an additional blooming mill soaking pit, an ingot mold dipping plant, slag handling equipment, additional cold rolled tin plate finishing capacity and other items at the company's Indiana Harbor, Ind., plant.

Taxes accrued rose from $1,788,000 in 1935 to $2,933,000 in 1936 and $6,019,000 in 1937. Part of the increase, according to the report, was caused by larger earnings and fewer allowable deductions but the so-called social security taxes absorbed a large amount. These taxes for unemployment compensation and old-age benefits commenced in 1936 and were $370,000 in that year; in 1937 they were $1,303,000. In addition to these taxes, the company was required to deduct from employes' wages and pay to the government in 1937 $438,000 for old age benefits.

NATIONAL'S TAXES $9,909,000; NET EARNINGS $17,801,892

National Steel Corp.'s earnings for 1937, before provision for the surtax on undistributed profits, were $19,516,892, equal to $9 per share on outstanding capital stock. Provision for the surtax amounted to $1,715,000, or 79 cents per share, so that net earnings were $17,801,892, or $8.21 per share.

Total taxes for the year amounted to $9,908,968, equal to $4.57 per share, which represented, on a comparable basis, an increase of $3,691,309 over 1936. This increase is equal to $1.70 per share. E. T. Weir, chairman, points out that the total 1937 tax bill represents a payment of $495.87 for each of the steel firm's 19,983 employes, as against $294.45 per employe for 1936.

Payroll Exceeds $39,000,000

Referring to the amicable relations with employes, Mr. Weir stated that wage rates were increased about 18 per cent early last year and that total wages paid in 1937 exceeded the 1936 payroll by more than $5,000,000.

Total payroll for 1937 was $39,254,006, which represented an average annual earning of $1964 per employe. Included in this amount was the disbursement of $528,986 under the vacation-with-pay plan inaugurated in the preceding year.

Dividends amounted to $7,584,519, or $3.50 per share. Payment was made at the quarterly rate of 62½ cents with two special dividends of 50 cents per share each. The earned surplus account was increased by $10,217,373.

Working capital at the year-end was $34,162,304, a decrease of $6,448,225. Stating the company has ample working capital, Mr. Weir pointed out that the decrease was caused by the large amount—$22,769,923—spent during the year for plants and equipment.

Important among improvements is the program at Great Lakes Steel Corp., National's Detroit subsidiary, carried on actively through the year.

With completion of this program, within 90 days, National will have an ingot capacity of about 3,400,000 tons and will become the fifth largest producer in the steel industry.

REPUBLIC'S 1937 TAXES EXCEED ITS NET PROFIT

Republic Steel Corp.'s report shows net profit of $9,044,147 after all charges for 1937, compared with $9,586,922 in 1936. Dividend disbursements during the year amounted to $3,846,567. Accrued and unpaid cumulative dividends on the 6 per cent cumulative convertible preferred stock were reduced from $25.50 to $13.50 per share on the 119,597 shares outstanding. Total of all direct taxes for the year amounted to $9,334,681, exceeding the net profits by a substantial amount, and were 35 per cent greater than $6,922,763 paid out in taxes during 1936.

LUDLUM'S RECORD YEAR

Ludlum Steel Co., Watervliet, N. Y., reports for 1937 net profit of $1,120,422, equal to $2.25 per share on 497,600 shares of $1 par common stock. This is the largest year's profit in the company's history, and compares with $1,041,245 or $1.95 a share on 496,437 shares in 1936. A new record was made in the net sales volume in 1937, amounting to $13,054,202, against $10,829,217 in 1936, its previous record year. Dividends and taxes last year amounted to $1,082,945, and of this taxes took $585,664, or the equivalent of 33 per cent of the year's consolidated profits before taxes.

WHEELING STEEL CORP.

Net profit for 1937 reported by Wheeling Steel Corp., Wheeling, W. Va., is $4,238,488, against $4,115,388 in the preceding year. Cash dividends of $2.50 per share, aggregating $875,602, were paid on the new $5 cumulative convertible prior preferred stock in 1937, and dividends amounting to $5.50 per share, aggregating $1,047,509, were paid on the 6 per cent cumulative preferred stock. Unpaid dividends on 6 per cent cumulative preferred stock still outstanding Dec. 31 amounted to $24 per share, or $751,320. Taxes in 1937 amounted to $2,698,117, equivalent to $4.79 per share on common stock outstanding.

JOSLYN PAYS EMPLOYES FUND $180,000 FOR 1937

Joslyn Manufacturing & Supply Co., Chicago, manufacturer of pole line hardware and other products, turned over $180,000 of its 1937 earnings to the employes profit sharing fund. This is more than double the amount paid into the fund in 1936. Net income last year was $917,800, against $482,130 in 1936.

The company has operated a profit sharing plan for nearly 18 years. Under the present plan (STEEL, Nov.

15. p. 23) the company pays a minimum of 10 per cent of its net earnings into the fund. In practice about 20 per cent of net earnings has been added to the fund in most years.

FINANCIAL NOTES

Consolidated net income of Crucible Steel Co. of America, New York, for 1937 is placed at $4,017,931 or $5.21 a common share. This is the best showing since 1929 and compares with $3,067,156 in 1936.

♦

American Rolling Mill Co., Middletown, O., has declared the regular quarterly dividend of $1.12½ a share on preferred stock, payable April 15 to record of March 15.

♦

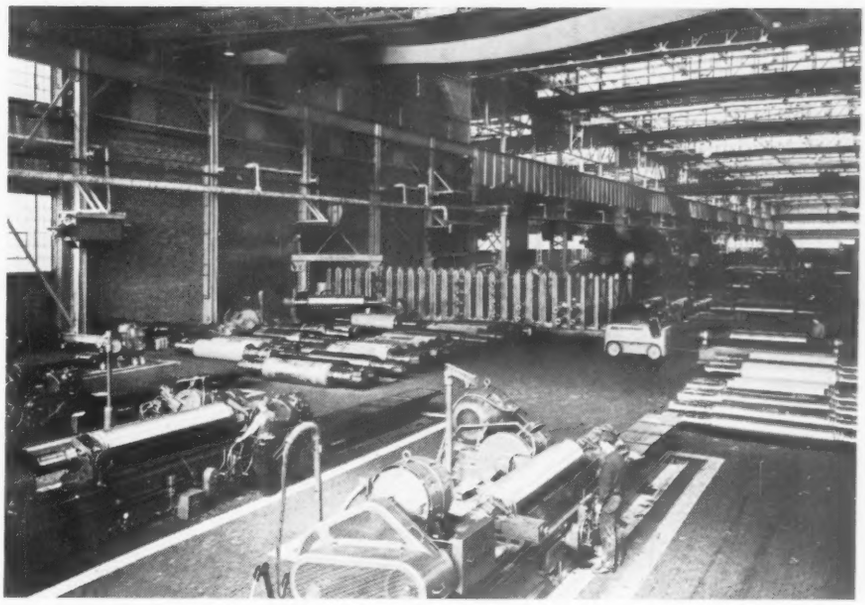
Granite City Steel Co., Granite City, Pa., declared a dividend of 12½ cents a share on common stock, payable March 30 to record of March 16.

♦

Eastern Rolling Mill Co., Baltimore, Md., reports for 1937 net profit of $121,667, equivalent to 58 cents a share on 210,000 shares of $5 capital stock. This compares with $72,074 or 34 cents a share in 1936.

♦

Cleveland-Cliffs Iron Co., Cleveland, reports net profit of $5,020,903 for 1937, its best year since 1929. This is equal to $10.30 a share on preferred stock, on which dividends of $6.50 were paid, thereby reducing arrearage to $23.16. The 1936 net was $3,145,294.



■ **Inside the cold mill building at Republic Steel Corp.'s new 98-inch continuous strip mill, showing the roll shop in the foreground. The 3-stand tandem cold reduction mill is in the center right**

World's "Largest, Fastest" Continuous Strip Mill Opened in Cleveland

■ REPUBLIC STEEL CORP. will give a preview of its new $15,000,000, 98-inch continuous strip mill—"largest, fastest, most modern in the world"—to newsmen in Cleveland, Tuesday, March 15.

Embodied in the mill's design are many interesting and important features which will be described and illustrated in STEEL, March 21.

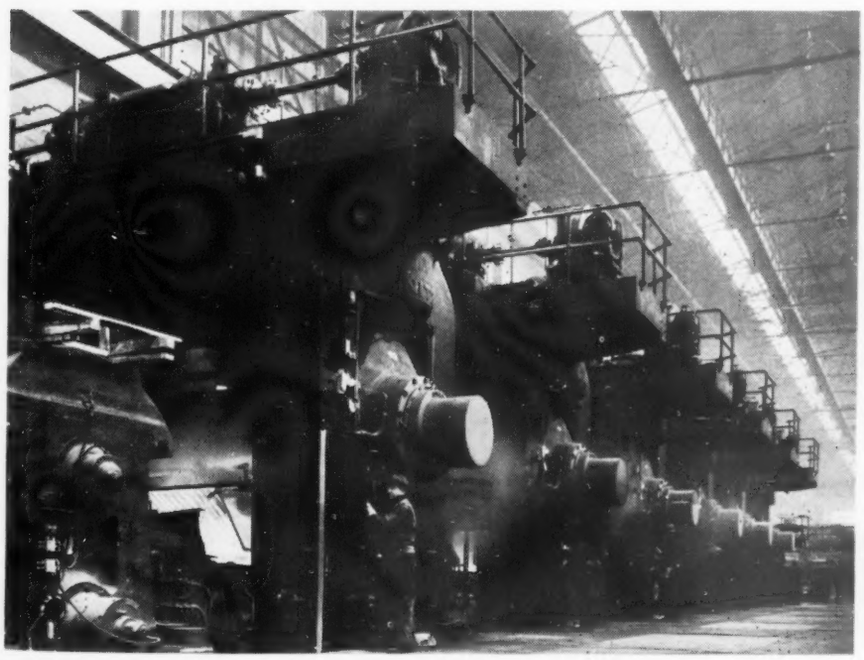
Maximum delivery speed of the hot mill is 2121 feet a minute. It rolls all finished widths from 30 to 94 inches and all finished thicknesses from 18-gage strip to half-inch plate. Rated capacity is 70,000 gross tons a month.

Slabs, produced in the company's adjoining Corrigan, McKinney plant, run the gamut of passes in all stands, sometimes taking as much as a 50 per cent reduction in a single pass, and the strip is rolled into a coil a quarter of a mile from the heating furnaces in four minutes.

Hot mill includes two scalebreakers, a broadside mill, three roughing and six finishing stands. Cold mill has three 4-high stands.

Particular attention was paid to safety and welfare of the workers in designing the plant. Buildings are modern high-roof industrial type with a maximum of window space for natural lighting. Moving machinery is enclosed, floors are level, ventilation and heating engineered to provide healthful working conditions.

Plant includes nine large buildings housing the mills, an office building with testing and metallurgical laboratories, a welfare building with shower and dressing rooms, a machine shop, carpenter shop and large pump house.



■ **This train of six hot mill finishing stands at Republic's new 98-inch continuous strip mill in Cleveland can roll strip at a delivery speed of 2100 feet per minute, "the fastest wide continuous strip mill in the world"**

Rate Increases Disappoint Railroads; Expect Light Upturn in Steel Buying

■ MODERATE improvement in steel buying by the railroads is expected to follow last week's decision by the interstate commerce commission to grant freight rate increases.

Although the commission's ruling was disappointing to the carriers (asked was a horizontal 15 per cent increase; granted were advances averaging 5 to 6 per cent), certain maintenance and replacement buying held up pending the decision now will be released.

Also anticipated is a slight upturn in buying by other consumers in the next two weeks or before the higher rates go into effect.

Directly affecting the iron, steel and metalworking industries are these provisions:

Rates on iron, steel, limestone and scrap are advanced 10 per cent over the rates prevailing before the raise last fall. Increases granted at that time are included in the new increase.

Rates on iron ore, bituminous coal and coke remain unchanged.

Switching and similar rates advanced 10 per cent over rates prevailing before the last increase.

Applied to finished steel and pig iron shipments, this means short haul rates will be unchanged and long haul rates increased. The increase made effective last November was 10 per cent with a maximum of 1 cent per hundred pounds. Last week's decision removes the maximum limit, increases the high rates.

Assembly costs will be affected only slightly. Rates on principal raw materials for pig iron making —ore, bituminous coal and coke— continue at present levels. Limestone is subject to the same increases as iron and steel.

In general last week's increases tend to equalize those granted last fall when heavy commodities, iron and steel, coal and ore, bore a major share.

New rates will become effective ten days after the carriers file tariffs. These are being revised rapidly as possible, and probably will go into effect about April 1.

To the railroads will accrue additional revenues variously estimated: at $270,000,000 by Commissioner Joseph B. Eastman; at $175,000,000 by officials of the Association of American Railroads. Increases asked by the railroads were estimated at $437,337,000 annually.

Railroads Disappointed

Spokesmen for the carriers expressed disappointment asserting the additional revenue will be inadequate to offset higher tax, labor and material costs. Especially disappointed were the western railroads, affected by the exceptions on agricultural products. The commission allowed a 5 per cent increase on agricultural products, with important exceptions.

Several of the commissioners wrote concurring opinions warning the railroads that much corporate and financial housecleaning stood between them and sound operation. In its annual report the commission had indicated it did not consider rate increases as a means of solving the carriers' basic ills.

Last week's opinion pointed out that higher rates might be offset by decreasing traffic volume, and that a 15 per cent increase might "be such a deterrent to traffic as to stifle movement."

Steelmakers believe the increases are insufficient to permit railroads to release any great amount of deferred steel buying at present. They do anticipate moderate improvement, and release of some steel for equipment and replacements, especially rails.

Likewise rate increases on finished steel and pig iron are expected to stimulate some forward buying before the new rates go into effect. As increases are considerable only on long hauls, most steel men doubt the situation will cause an extraordinary spurt in buying.

How the new rates will affect steel shipments is indicated in the following tables.

It is generally believed the ruling for simplification of fractions put into effect last November again will apply. This provided fractions under 0.25 be eliminated; fractions from 0.25 to 0.74 be figured at ½ cent; and that fractions from 0.75 up at 1 cent; that rates figured in cents per ton, 0.49 and less be eliminated, and 0.50 and up taking the full cent.

Pittsburgh to	Before Nov. 15	Present Rate	New Rate
Butler	8.5	9.5	9.5
Johnstown	13.25	14.25	14.5
Altoona	17.5	18.5	19.5
Harrisburg	24.0	25.0	26.5
Philadelphia	29.0	30.0	32.0
New York	33.0	34.0	36.5
Easton	29.0	30.0	32.0
Williamsport	22.0	23.0	24.0
Chicago to			
Peoria	16.5	17.5	18.0
Joliet	8.0	9.0	9.0
Rockford	12.0	13.0	13.0
Cairo	26.0	27.0	28.5
Aurora	8.0	9.0	9.0
Mt. Vernon	22.0	23.0	24.0
Cleveland to			
Mansfield	13.25	14.25	14.5
Ashland	12.5	13.5	14.0
Massillon	11.25	12.25	12.25
Lorain	6.5	7.0	7.0
Akron	10.5	11.5	11.5
Canton	10.5	11.5	11.5
Geneva	10.0	11.0	11.0
Galion	13.25	14.25	14.5
Newcomerstown	16.5	17.5	18.0
Norwalk	10.5	11.5	11.5
Mt. Vernon	17.5	18.5	19.5
Sparrows Point to			
Philadelphia	15.25	16.25	17.0
New York	21.5	22.5	23.5
Cumberland	20.0	21.0	22.0
Hagerstown	14.5	15.5	16.0

Typical per ton rates from Cleveland afford a similar comparison for pig iron:

Cleveland to	Old	Present	New
Bellefontaine	$2.39	$2.59	$2.68
Akron	1.26	1.39	1.39
Mansfield	1.76	1.94	1.94
Cincinnati	2.90	3.10	3.19
Barberton	1.26	1.39	1.39
Columbus	2.10	2.30	2.31
Dayton	2.52	2.72	2.77
Elyria	.76	.84	.84
Defiance	2.65	2.85	2.92

Modern Way on the Santa Fe Trail

■ **Five of Santa Fe's 13 diesel-electric streamlined locomotives and trains lined up in Chicago recently. Two 900-horsepower General Motors V-12, two-cycle diesel engines develop 1800 horsepower for each locomotive, built by Electro-Motive Corp., La Grange, Ill. They are capable of 117 miles per hour**

February Ingots Up 8.9 Per Cent

■ PRODUCTION of steel ingots in February was at the average rate of 31.73 per cent of capacity, compared with 29.14 per cent in January. The average weekly tonnage was 425,811, compared with 391,031 in January, a gain of 8.9 per cent, according to American Iron and Steel institute.

A total of 1,703,245 gross tons was produced in February, which was 1.67 per cent less than the 1,732,266 tons made in January. The higher rate almost made up for the three less working days in February.

In comparison with February, 1937, when production was 4,413,832 tons, ingot output showed a loss of 60 per cent. The rate in February last year was 84.25 per cent and average weekly output 1,103,458 tons.

Italy To Use Domestic Ore Instead of Scrap

■ Italy is planning to utilize native iron ore in electric furnaces to produce pig iron for steelmaking, thus reducing heavy imports of scrap, according to the department of commerce. The intention is to increase furnace capacity to handle five times as much of the domestic ore as at present, which will supply about half the raw material needed for steel requirements. Domestic ore is in the form of iron pyrites, with about 58 per cent iron and a large content of sulphur.

Research as a basis of this plan indicates steel can be produced more cheaply than by use of imported scrap. A financing company has been created, with head office in Rome, and capital provided by an issue of bonds guaranteed by the state, to run 20 years at 4.5 per cent.

■ Seaboard chapter, the eighteenth in the Institute of Scrap Iron and Steel, was formed recently at Baltimore.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Mar. 12	Change	Same week 1937	Same week 1936
Pittsburgh	26	— 1	89	43
Chicago	27.5	+ 1	82.5	62
Eastern Pa.	29	— 1	57.5	39
Youngstown	29	None	85	71
Wheeling	38	None	96	78
Cleveland	28	None	78	75
Buffalo	18.5	— 2.5	90	42
Birmingham	61	+ 3	77	69
New England	15	None	97	51
Cincinnati	32	+22	68	76
St. Louis	37	+ 9	82	†
Detroit	33	— 2	95	94
Average	30	+ 0.5	87	57.5

†Not reported.

Steel Ingot Statistics

Monthly Production—Complete for Bessemer; Open Hearth, Calculated from Reports of Companies Making 98.29 per cent in 1936

1938	—Open Hearth— Gross tons	Per cent of capacity	—Bessemer— Gross tons	Per cent of capacity	— Total — Gross tons	Per cent of capacity	Weekly production, all companies, gross tons	Number of weeks in month
Jan.	1,632,275	30.24	99,991	18.27	1,732,266	29.14	391,031	4.43
Feb.	1,577,752	32.37	125,493	25.40	1,703,245	31.73	425,811	4.00
2 mos.	3,210,027	.....	225,484	.....	3,435,511	.....	407,533	8.43
1937								
Jan.	4,433,145	84.20	291,749	54.29	4,724,894	81.43	1,066,567	4.43
Feb.	4,082,163	85.87	331,669	68.35	4,413,832	84.25	1,103,458	4.00
2 mos.	8,515,308	.....	623,418	.....	9,138,726	.....	1,084,071	8.43
March	4,812,879	91.42	403,364	75.06	5,216,243	89.90	1,177,481	4.43
April	4,681,677	91.83	388,768	74.70	5,070,445	90.24	1,181,922	4.29
May	4,767,269	90.55	382,582	71.19	5,149,851	88.76	1,162,495	4.43
June	3,899,190	76.48	284,572	54.68	4,183,762	74.46	975,236	4.29
July	4,220,561	80.09	335,440	62.56	4,556,001	78.48	1,030,769	4.42
Aug.	4,502,243	85.25	373,428	69.49	4,875,671	83.79	1,100,603	4.43
Sept.	4,029,921	78.98	268,433	51.70	4,298,354	76.46	1,004,288	4.28
Oct.	3,203,447	60.66	189,244	35.22	3,392,691	58.31	765,844	4.43
Nov.	2,040,020	39.89	113,761	21.86	2,153,781	38.22	502,047	4.29
Dec.	1,385,406	26.29	86,835	16.20	1,472,241	25.36	333,086	4.42
Total	46,057,921	74.21	3,449,845	54.54	49,507,766	72.39	949,516	52.14

Percentages of capacity operated for 1938 are calculated on weekly capacities of 1,218,342 gross tons of open-hearth ingots and 123,514 gross tons of bessemer ingots, total 1,341,856 gross tons; based on annual capacities as of Dec. 31, 1937, as follows: Open-hearth ingots, 63,524,356 gross tons; bessemer ingots, 6,440,000 gross tons.

Percentages of capacity for the first six months of 1937 are calculated on weekly capacities of 1,188,452 gross tons for open-hearth ingots, 121,308 tons for bessemer and 1,309,760 tons total, based on annual capacities as of Dec. 31, 1936, as follows: Open-hearth ingots, 61,965,862 gross tons; bessemer, 6,325,000 tons; beginning July 1, 1937, on weekly capacities of 1,192,182 gross tons open-hearth ingots and 121,308 gross tons bessemer, total 1,313,490 gross tons; based on annual capacities as follows: Open-hearth ingots, 62,160,362 gross tons; bessemer, 6,325,000 gross tons.

PRODUCTION

■ INCREASE of half a point raised the national steelworks operating rate last week to 30 per cent.

Cleveland—Rate is unchanged at 28 per cent. National Tube Co. has returned its open hearths at Lorain, O., to production after using bessemer capacity the past ten days.

St. Louis—Gained 9 points to 37 per cent as one interest added two furnaces and another added one.

Central eastern seaboard—Down 1 point to 29 per cent.

Birmingham, Ala.—Up 3 points to 61 per cent after slight dip of preceding week.

Pittsburgh—Slight slowing of operations caused the rate to fall 1 point to 26 per cent. Expectations are for a slightly better level this week.

Wheeling—Unchanged at 38 per cent, changes in activity offsetting each other.

Detroit—Off 2 points to 33 per cent, 7 of 21 furnaces operating all week.

Chicago—Increased 1 point to 27.5 per cent, the best rate in seven weeks. Indications are for the same schedule this week.

New England—Steady at 15 per cent, which will hold for this week. Only one producer is making ingots.

Cincinnati—With staggered operations, the steelmaking rate increased 22 points to 32 per cent last week. The same rate is indicated for this week.

Buffalo—Loss of 2.5 points to 18.5 per cent.

Youngstown—Remained at 29 per cent last week with schedules for 27 per cent this week when two open hearths will be taken off.

Foreign Machine Tool Orders Drop Sharply

■ Abrupt decline in foreign sales in February caused the index of machine tool orders to drop to 75.7, compared with 118.4 in January, according to the National Machine Tool Builders' association, Cleveland.

Foreign orders index fell to 27 from 75.2 in January. Export orders, which since last fall have been a major factor in keeping the machine tool orders index higher than other business indices, in February amounted to 35 per cent of total volume. In January, foreign orders comprised 63 per cent of the total.

Index of domestic orders, after six months of uninterrupted downtrend, gained more than 10 per cent to 48.7. Inquiries are reported stronger.

20,000 See Tool Engineers' First National Exposition; 153 Exhibitors

■ WHILE a recession could not be considered the best time in which to launch a new national industrial exhibition, 20,000 persons in four days last week filed past 153 displays of tools, equipment and products during the American Society of Tool Engineers' first machine and tool progress exposition in Convention hall, Detroit.

Directors have decided the show will be held again next year, probably in Detroit.

Questioning a cross section of exhibitors revealed the show to be an unqualified success. Numerous orders for tools and equipment were placed; and the greater proportion of those attending the show evinced a genuine interest in the displays.

Typical was the experience of one exhibitor who sold a $3000 machine within two hours of the show's opening.

Westinghouse Electric & Mfg. Co. booked an order which paid for its exhibit space.

Timing the show at the onset of the busy season for automotive tool and die designers proved a happy choice, since among this classification of engineers and operators at the moment is a lively interest in latest developments in the field.

Special trains began arriving Wednesday bringing large contingents of A.S.T.E. members from eastern cities, and at the close of the show that night an official count of attendance showed 4600.

The first day's attendance included 190 men from the junior engineering school of Chrysler Corp., who arrived in a body. Other educational groups included engineering classes from the University of Detroit, University of Michigan, Hudson Motor Co. apprentices, and similar organizations.

While all exhibits were crowded for the duration of the exposition, scores concentrated where large plastic molding machines were erected and in operation on souvenir plastic pieces such as golf tees, ash trays, coasters and the like. At least three large injection molding machines were in operation almost constantly for four days on this work. A high percentage of operating exhibits served to enhance interest in these displays, among such equipment being small grinders, drill presses, lathes, motors and controls, metalcutting saws, filing machines, presses, gear shaving machines, flexible shaft abrasive equipment and hydraulic units.

Tours were arranged through 15 automotive and parts plants in the Detroit district, while a dozen other plants held open house.

The convention opened Wednesday evening with a "Scandinavian supper" or smorgasbord, attended by 1800 members and guests of the society. Following the dinner and official welcome from a representative of the Detroit mayor's office, the first of three evening technical sessions was introduced by J. R. Weaver, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., who headed the committee arranging the program. Subject was the preparation of standards for surface quality of metal and was presented by Dr. E. J. Abbott, president, Physicists Research Corp., Ann Arbor, Mich.

Dr. Abbott's discussion was partially in the nature of a report of an American Standards association committee now at work on this subject. Surface irregularities were grouped into two classes—roughness, in which the distance between peaks is less than 1/32-inch; and waviness, in which this distance is over 1/32-inch. These irregularities appear to varying degrees in all types of finished surfaces—bored, honed, reamed, diamond bored, etc. Their measurement presents a particular problem, especially in the shop, since a typical irregularity may not exceed 0.000025-inch in depth.

This measurement is being ac-

New Officers of Tool Engineers' Society

President
WALTER F. WAGNER
Mechanical Superintendent, Lincoln Motor Car Co., Detroit

First Vice President
J. R. WEAVER
Director, Equipment, Inspection and Tests, Westinghouse Electric & Mfg. Co., East Pittsburgh

Second Vice President
GEORGE A. SMART
Tool Supervisor, Allis-Chalmers Mfg. Co., Milwaukee

National Secretary
CHARLES F. STAPLES
Detroit

Executive Secretary
FORD R. LAMB
Detroit

Treasurer
FRANK R. CRONE
Lincoln Motor Car Co., Detroit

■ One hundred and fifty three companies participated in the first machine and tool progress exhibition of the American Society of Tool Engineers in Convention hall, Detroit, last week

complished successfully, according to Dr. Abbott, by a machine developed by his company, known as a profilometer. Essentially it involves a small diamond point mounted in a tracer which is moved across the surface to be examined. Movement of this point is amplified and translated electrically in terms of millionths of an inch, and the surface irregularities may be observed from a meter or may be further recorded on sensitized paper by transmitting the impulses through a cathode ray oscillograph.

The profilometer may be adjusted in various ways to bring out either roughness or waviness, and to amplify any phase of the irregularity. In adapting the profilometer to calibration of finishes in the shop, Dr. Abbott suggested the preparation of samples or specimens of various surfaces, examining them with the profilometer to ascertain the exact nature of irregularities and their effect, then supplying these samples to the shop as a guide to the results desired in production.

New Finish Specifications

Discussing Dr. Abbott's presentation from the engineer's viewpoint, Harry T. Woolson, executive engineer, Chrysler Corp., Detroit, pointed out that engineers would welcome a system whereby surface finishes could be specified on a drawing by number instead of the present arrangement of specifying by method. Mr. Woolson also cited how progressive improvement in surface quality of metal parts had practically eliminated the need for run-in periods on such mechanisms as automobile engines.

Mr. Woolson remarked that any device for shop testing or gaging of surfaces should be of a simple, rugged design, and should be rapid in operation. He also brought up the importance of direction of scratches or irregularities on a metal surface.

R. V. Hutchinson, Olds Motor division, General Motors Corp., Lansing, Mich., gave some interesting observations as to the viewpoint of the shop man. He recalled the work which producers of ball and roller bearings have done on inspection of surface quality, and further stressed the importance of uniformity of material on surface quality.

Prepared discussion by F. J. Malone, Hercules Motor Co., Canton, O., was read by C. Ray Brunner, Dodge division of Chrysler Corp., in the absence of the author. Mr. Malone recommended that the shop man be given calibrated samples of what was expected in the way of surface finish, so that he could guide production accordingly.

MEETINGS

ZINC INSTITUTE TO MEET WITH GALVANIZERS' GROUP

■ TWENTIETH annual meeting of the American Zinc institute will be at Hotel Statler, St. Louis, April 25-26. The first day will be devoted to reports on institute activities, the outlook for zinc, and events in Washington. Second day will include topics relating to developments of zinc coatings and market for zinc coated products.

The Galvanizers committee, sponsored by the institute, will conduct its fourth meeting at the same place, April 25-27. It will join with the institute in the session on the morning of the first day, in the afternoon will hold a roundtable conference for members only. The second day's sessions will be held jointly. Another closed session on the morning of the third day will conclude the committee's meeting.

Both groups will attend a dinner, evening of April 25.

BLAST FURNACE COMMITTEE ORGANIZES ITS PROGRAM

Committee on blast furnace and raw materials of the Iron and Steel division, American Institute of Mining and Metallurgical Engineers, has developed a tentative program for its meeting at Statler hotel, Buffalo, April 20-22. This committee is convening at the same time as the institute's open-hearth committee.

The blast furnace group will hold its own session morning and afternoon of the first day and morning of the third day. The two committees will meet jointly on the morning of the second day and will both participate in an inspection trip to the Lackawanna plant of the Bethlehem Steel Co. in the afternoon.

Among scheduled topics are pressure operations of blast furnaces, sintering of iron ores, and coke quality.

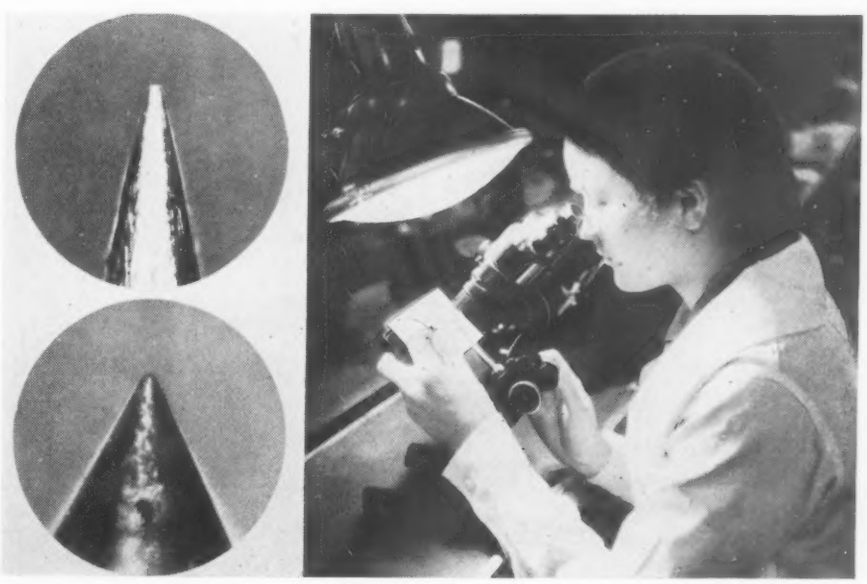
S.A.E. TO HOLD ITS FIRST PASSENGER CAR MEETING

Society of Automotive Engineers has completed the program for its first national passenger car meeting at Hotel Statler, Detroit, March 28-30. Technical sessions are to be held morning and afternoon of the first two days. First session will deal with engines, the second with chassis, the third with car suspension and ride, and the last with frames and bodies. Gen. Hugh S. Johnson will address the dinner, evening of March 29. An inspection trip to the Packard proving grounds, General Motors' research laboratories and Chrysler engineering laboratories, will be made on the third day.

STEEL ENGINEERS ARRANGE MEETING IN YOUNGSTOWN

Cleveland district section, Association of Iron and Steel Engineers,

Pointing Pivots Sharper Than Needles



■ **Delicate precision instruments by General Electric Co., West Lynn, Mass., are furnished with special steel pivots more pointed than a needle, as the above comparison shows. Upper view shows ordinary needle, while below is an instrument point, both magnified 125 times. Before final finishing pivot is inspected with 42-power microscope. Being too sharp for a bearing, end is rounded with jasper tool**

has arranged an inspection trip and technical meeting in Youngstown, O., March 21. In the afternoon, the group will visit Republic Steel Corp.'s electric weld tube mill. At the meeting in the Ohio hotel in the evening, C. H. Carpenter, sales manager, Lee Wilson Engineering Co., Cleveland, will present a paper "Radiant Tube Annealing Covers." A roundtable discussion will follow.

LIQUEFIED PETROLEUM GAS ASSOCIATION TO CONVENE

Liquefied Petroleum Gas association will hold its seventh annual convention at the New Jefferson hotel, St. Louis, March 21-22. This organization, which in January changed its name from the National Bottled Gas association, is affiliated with the Compressed Gas Manufacturers' association. A session on the afternoon of the first day will be concerned with officers' reports and elections; sessions on the second day will be devoted to marketing and uses of liquefied petroleum gases.

F. R. Fetherston, 11 West Forty-second street, New York, is secretary of the association.

ANNOUNCES DATE FOR NEW YORK POWER EXPOSITION

Thirteenth National Exposition of Power and Mechanical Engineering will be held in Grand Central Palace, New York, Dec. 5-10. These dates are coincident with the annual meeting of the American Society of Mechanical Engineers. As in the past, the exposition will be managed by the International Exposition Co., Grand Central Palace, New York, and will be under personal direction of Charles F. Roth, president.

WILL CONDUCT FOUNDRY CONGRESS IN POLAND

An international foundry congress will be held in Warsaw, Poland, Sept. 8-10. Since this year's congress is a European event, the American Foundrymen's association will not participate officially. Program includes a number of technical sessions and a meeting of the International Committee of Foundry Technical Associations. Upon conclusion of meetings in Warsaw, numerous organized visits will be made to plants in the industrial district of Poland. Official adjournment will be in Cracow, Sept. 17.

MIDWEST POWER MEETING UNDER NEW SPONSORSHIP

The Midwest Power Conference, operated in Chicago under private direction since 1926, will be directed in the future under sponsorship of Armour Institute of Technology and co-operation of Iowa State college, Purdue university, State University of Iowa, University of Illinois, University of Michigan, University of Wisconsin, and local and national engineering societies. The 1938 conference will be held at LaSalle hotel, Chicago, April 13-15.

Purpose of the conference will be to offer opportunity for persons interested in power production, transmission, or consumption, to meet annually for study of mutual problems free from the restrictions of required memberships in technical or social organizations. The program includes several technical sessions and inspection trips.

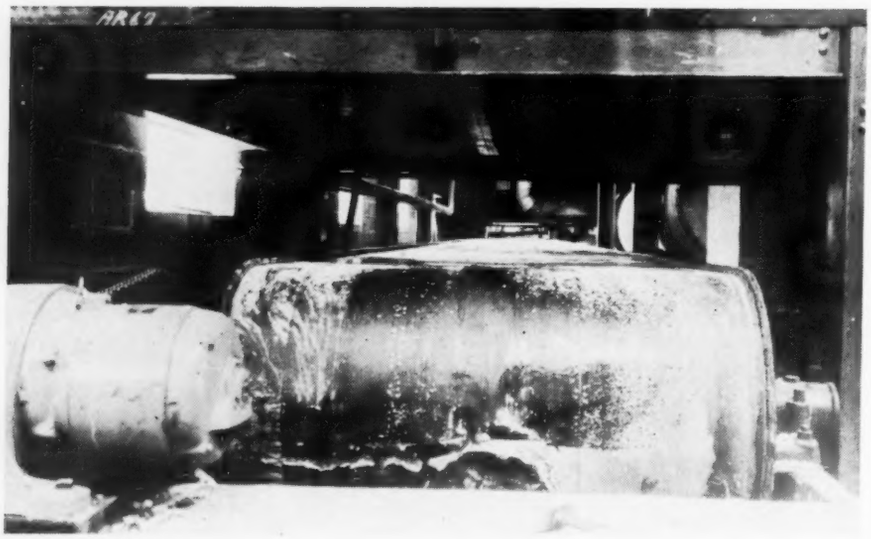
One session will deal with metals. Prof. A. E. White, director of engineering research, University of Michigan, Ann Arbor, Mich., will discuss "Metallurgy of Power Plants"; and J. P. Magos, in charge of research laboratory, and F. R. Zenton, research engineer, Crane Co., Chicago, will discuss "Steam Erosion of Ferrous and Nonferrous Metals."

Stanton E. Winston, Armour Institute of Technology, 3300 Federal street, Chicago, is secretary.

FRENCH FOUNDRY GROUP TO HOLD MEETING IN JUNE

Annual convention of the Association de Fonderie will be held in Lyon, France, June 9-11. Among subjects scheduled for discussion are specifications for and properties of castings, foundry practice, safety and hygiene.

Wide Flexible Steel Conveyor Belt in Operation



■ **This flexible conveyor belt, 69 inches wide, of heat-treated 0.65 carbon steel, with capacity for 4500 pounds, has been installed in an eastern manufacturing plant. The material is approximately equivalent to spring steel. It is joined longitudinally by patented flexible butt straps, the ends by lapping and riveting. A strip of rubber an inch high on each edge prevents material falling off. The belt is a product of Sandvik Steel Works, Sweden. A similar belt 13 feet wide and 180 feet long in process of fabrication was pictured in STEEL, Dec. 27, p. 17**

Test Stainless Steel Wing for Army Plane

■ Tests of a stainless steel airplane wing built for the army's new Seversky pursuit plane are being conducted at the plant of Edward G. Budd Mfg. Co., Philadelphia. Data are being obtained on the stainless steel and duralumin wings as to efficiency, rigidity and general utility.

Enea Bossi, head of the aircraft division, said the stainless steel wing was several pounds lighter than the duralumin part it is designed to replace, about four times as rigid, will stand up under seven times as much vibration and is entirely corrosion proof.

Tests are being observed by aeronautical experts representing the army, navy and private airlines.

Draper Nominated as Reserve Board Member

■ Ernest G. Draper, assistant secretary of commerce, last week was nominated by the President as a member of the federal reserve board. Mr. Draper was selected by Secretary of Commerce Roper as his assistant several years ago. Once a member of the department's business advisory council and active in industry for many years, he has been considered friendly to business since joining the commerce department.

Activities of Steel Users, Makers

■ SOUTHERN States Iron Roofing Co., Savannah, Ga., is establishing a branch at Hattiesburg, Miss., under the direction of B. E. Shea, who will be succeeded in management of the Birmingham, Ala., plant by James W. McIntire. Necessary equipment for the manufacture of steel drums, steel shingles, roofing and turpentine cups and aprons will be moved from Birmingham to Hattiesburg, but operations at Birmingham will not be affected.

♦

Barney Machinery Co. has moved its offices to 537 Union Trust building, Pittsburgh.

♦

Harnischfeger Corp., Milwaukee, has appointed Lyons Machinery Co., Little Rock, Ark., as sales representative for welders and welding electrodes.

♦

Phoenix Iron Co. will move its general offices from the Girard Trust building, Philadelphia, to its plant at Phoenixville, Pa., effective May 1. The company and its subsidiary, the Phoenix Bridge Co., will maintain district sales offices in Philadelphia.

♦

Audubon Wire Cloth Corp., Philadelphia, has appointed G. J. Hawkey, Cleveland Duplex Machinery Co. Inc., Cleveland, its representative in the Cleveland district.

♦

Cutler-Hammer Inc., Milwaukee, maker of electric control apparatus, has moved its Cincinnati office to the American building, Central Parkway at Walnut.

♦

Flexrock Co., Philadelphia, specializing in floor repair and building maintenance materials, has established a branch in Atlanta, Ga., in charge of J. F. Prince.

♦

Murray Iron Works Co., Burlington, Iowa, has appointed L. R. Merritt & Co., New York, sales representative in that district for turbines, engines and turbine driven unit heaters.

♦

Dominion Steel & Coal Co., Sydney, N. S., has installed a size "OT" Lectromelt furnace for high-grade steels for axles and other purposes. The furnace is operated with 10-ton heats, on the one slag and two slag processes.

♦

Darwin & Milner Inc., 1260 West Fourth street, Cleveland, has appointed Taylor H. Beech, 1031 Glenn street, Wilkinsburg, Pa., as sales representative for its products in the Pittsburgh area.

♦

Ingersoll-Rand Co. has been awarded contracts for the condensers, condenser pumps and boiler feed pumps for the Atlantic Refining Co.'s 18,500-ton welded tanker now under construction at the Sun shipyards, Chester, Pa.

♦

Fosdick Machine Tool Co., Cincinnati, has appointed Austin-Hastings Co. Inc., with headquarters in Cambridge, Mass., and branch offices in Providence, Worcester and Portland, as New England distributor.

♦

American District Steam Co., North Tonawanda, N. Y., maker of extension joints and other steam distribution equipment, has named M. J. Gibbons Supply Co., Dayton, O., and Pacific Factors, San Francisco, to distribute its products in their respective territories.

♦

Kincaid & Osburn Co., San Antonio, Tex., is installing a size "U" Lectromelt furnace for the production of plain and alloy steel castings in its new foundry. The furnace will be operated with heats ranging from 400 to 600 pounds. Hourly melting capacity is 250 pounds.

♦

Lidgerwood Mfg. Co., Elizabeth, N. J., has received the contract for the electro-hydraulic steering gear and the deck machinery for a second 18,500-ton turboelectric tanker now being built for the Atlantic Refining Co. at the Sun shipyards, Chester, Pa.

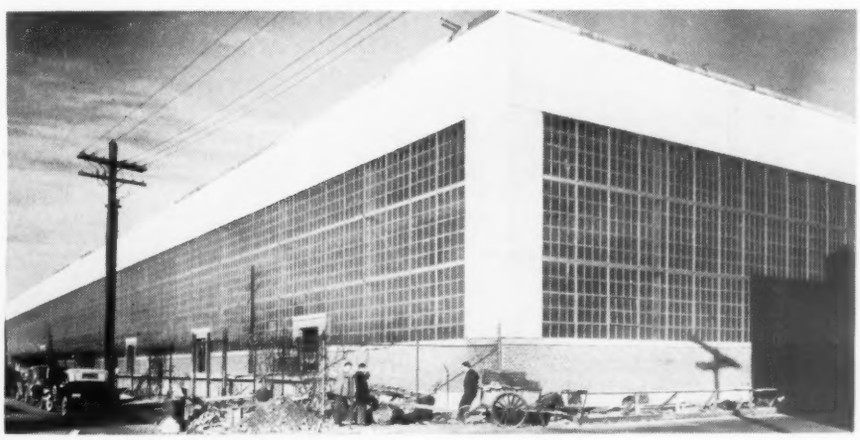
♦

Texas Electric Steel Co., Houston, Tex., has under way an expansion program which will double its steel casting output. Included is the installation of a 1½-ton electric furnace, electric crane, annealing furnace, additional core ovens and other equipment.

♦

Meehanite Metal Corp., Pittsburgh, has added the following to its list of companies licensed to make castings of Meehanite: Atlas Foundry Co., Detroit; E. Long Ltd., Orillia, Ont.; General Iron Works, Denver; English Electric Co. Ltd. and Butterley Co. Ltd., of Great Britain; Delattre & Frouard, France; Malleable Castings Co. Ltd., and the Australian Glass Manufacturers Ltd., of Australia.

$4,000,000 Invested in New Brass Mill



■ Bridgeport Brass Co.'s new rolling mill, Bridgeport, Conn., representing an investment of about $4,000,000 is rapidly nearing completion. It will be devoted to producing practically all the copper base alloys in sheet form. Construction has already given direct employment to an average of over 150 men per day since May 1, 1937.

More than 1375 tons of structural steel, 400,000 bricks, over 28,000 lights of glass with a sash area of 50,400 square feet, materials for 166,000 square feet of roof area, and enormous quantities of other materials were utilized in the mill and adjoining office and laboratory building. An equally substantial outlay has been made for modern machines, equipment and tools.

The mill, with a floor area of 200,000 square feet, was designed with an eye to the growing importance of materials handling for efficient operation. It follows the straight line principle, so effective in the steel industry. Smooth, continuous flow of metals from ingots to finished rolls, automatic devices for handling to insure speed and economy, ready adaptability to varying production requirements—these are the outstanding features. The mill will be in production by midsummer.

MEN OF INDUSTRY

■ LOUIS KUEHN, a founder of Milcor Steel Co., Milwaukee, and president since 1906, has been elected to newly created office of chairman of the board. He is succeeded as president by E. A. Tanner, heretofore vice president and sales manager. E. L. Lipman has been elected secretary and treasurer to fill the vacancy caused by the resignation of A. J. Luedke.

Mr. Tanner has been associated with the company 18 years and from 1930 to 1936 was general manager of the Eller Mfg. Co. division at Canton, O.

♦

Arthur R. Robinson, R. L. Batteiger & Co., Philadelphia, has been appointed chairman, public relations committee, Institute of Scrap Iron and Steel Inc., New York.

♦

Harry Terry, who resigned a year ago as vice president of Cramer-Krasselt Co. to open his own offices as an advertising and sales economist, has moved to new quarters at 8 South Michigan avenue, Chicago.

♦

W. P. Hemphill, chairman of the finance committee, Borg-Warner Corp., Chicago, has become a partner of McKinsey, Wellington & Co., management consultants, with offices in Chicago, New York and Boston.

♦

Max W. Babb, president, Allis-Chalmers Mfg. Co., Milwaukee, has been re-elected national councillor for the Milwaukee Association of Commerce on the board of the United States Chamber of Commerce.

♦

F. G. Carrell has been appointed general manager, steel division, Northwestern Barb Wire Co., Sterling, Ill. He formerly was vice president and director of Calumet Steel Co., Chicago, with which company he had been associated for more than 20 years.

F. G. Carrell

Louis Kuehn

J. P. Hook, formerly treasurer, Calumet Steel Co., has been named assistant manager of sales, steel division, of the Northwestern company.

♦

W. W. Cochrane, Milwaukee, has been appointed representative in the state of Wisconsin for the Acme Machine Products division, Serrick Corp., Muncie, Ind. He will maintain headquarters at 828 North Broadway.

♦

N. W. Cassel, vice president and secretary, Harrisburg Steel Corp., Harrisburg, Pa., and Leonard J. Buck, of New York, have been elected directors of the corporation, in place of W. P. Starkey Sr. and Leroy S. Bishop.

♦

Chester C. Bolton, of Cleveland, former congressman, has been elected a director of the Lamson & Sessions Co., Cleveland, to fill the vacancy caused by the death of John G. Jennings, chairman of the board and director.

♦

Samuel H. Vauclain and George H. Houston have been re-elected chairman and president, respectively, of the reorganized Baldwin Locomotive Works, Philadelphia. Other officers also have been re-elected, with the exception of John P. Sykes, vice president, who resigned.

♦

Otto Miller, senior partner of the investment firm of Hayden, Miller & Co., Cleveland, has been elected a director, Otis Steel Co., Cleveland, to fill the vacancy caused by the recent death of Frank H. Ginn, Cleveland attorney.

♦

Gerald Kochenderfer, sales manager, National Tool Co., Cleveland, has been elected a director of the company and a member of the executive committee. He fills vacancies caused by the death of E. J. Lees. Previous to joining the company last June, Mr. Kochenderfer had been associated 17 years with Warner & Swasey Co.

♦

A. B. Bassoff has been named general manager, Atlantic Gear Works, New York. He formerly was consulting engineer for the Sier Bath Co., New York, and before that was production manager for the Worth Steel Co., Claymont, Del. Richard Beers has been named works superintendent, and C. Dahlerup will continue as general superintendent.

♦

Paul Davenport has been added to the Philadelphia district office of Bailey Meter Co., Cleveland. Other cadet engineers assigned to branch office duty are: H. E. Eleniewski, Buffalo, territory; O. L. Garretson, St. Louis; H. R. Kroeger, Denver; F. M. LeCompte, New York; H. R. Leuthy, Chicago; T. O. Thompson, Houston, Tex.; P. H. Vernor, Milwaukee; J. H. Dennis, Pittsburgh.

♦

George H. Johnson, vice president, Gisholt Machine Co., Madison, Wis.; L. D. Harkrider, president, General Malleable Corp., Waukesha, Wis., and Harold S. Falk, vice president, Falk Corp., Milwaukee, have been appointed by Gov. Philip F. LaFollette of Wisconsin as members of the employers' committee established by the Wisconsin state labor relations act.

♦

Lee B. Green, formerly vice president and works manager, Globe Machine & Stamping Co., Cleveland, has been appointed general manager, Steelweld Machinery Co., Cleveland, maker of press brakes, bulldozers, and special metal forming machinery. Mr. Green served an apprenticeship with Morgan Engineering Co., Alliance, O., following which he worked successively as a machin-

Lee B. Green

ist in railroad shops, locomotive fireman, designer for the Cleveland Frog & Crossing Co., chief engineer for the Stenotype Co., master mechanic with Timken Roller Bearing Co., and superintendent of Lincoln Motor Co.

♦

Charles S. Pearce has been appointed secretary, Porcelain Enamel Institute Inc., Chicago. He succeeds George P. MacKnight. A graduate of Ohio State university, 1924, Mr. Pearce has had considerable experience in the manufacture of porcelain enamel, having been head of the porcelain enameling department of Frigidaire Corp., Dayton, O., and in charge of enameling operations, Davidson Enamel Co., Clyde, O. In the fall of 1935 he joined the farm security administration as assistant director of personnel, which position he leaves to assume his new duties.

♦

Charles L. Cordes, associated 34 years with American Steel & Wire Co., Cleveland, is retiring from the position of assistant traffic manager. He is succeeded by Harry M. Knobel, chief clerk in the freight department. Mr. Cordes started working for the Wire company in June, 1904, as chief clerk at Pittsburgh. Mr. Knobel has been with the company since September, 1915.

♦

Edwin M. Fuller, representing Lamson & Sessions Co., Cleveland, in New York, Pennsylvania and eastern Ohio, has been appointed eastern district sales manager, with headquarters in Cleveland. George P. Tinnerman, formerly with Bayonne Bolt Corp., will represent Lamson & Sessions in metropolitan New York, New Jersey and Philadelphia, and J. L. Salter, will represent the company in western New York, Pennsylvania and eastern Ohio.

♦

R. A. Gezelius, formerly associate metallurgist of the Naval Research laboratory, Washington, has become associated with Taylor-Wharton Iron & Steel Co., High Bridge, N. J., as metallurgist. He recently was awarded honorable mention by the American Foundrymen's association for his work in metallurgy. Before entering the Naval laboratory, Mr. Gezelius studied at Michigan State college where he received the degrees of Bachelor of Science in industrial chemistry and Master of Science in physical metallurgy.

♦

Hugh Courteol, associated with General Motors Corp. for the past 18 years, and in recent years vice president and manager of operations of General Motors Holding Corp., New York, has been elected president Mercoid Corp., Chicago. I. E. McCabe, chief engineer of the company since its formation, is now chairman of the board. He will, however, continue in active charge of engineering and development, J. W. Owens is executive vice president in charge of sales; R. H. Chadwell has been elected treasurer, and Thomas P. Crawford, secretary.

Charles S. Pearce

♦

R. W. Neel, who has represented Manning, Maxwell & Moore Inc., Bridgeport, Conn., maker of valves, gages, thermometers and control instruments, is now in charge of the newly created southeastern district with headquarters in Atlanta, Ga. Malcolm Black has been made manager of the southwestern district with headquarters in Tulsa, Okla. Other additions to the sales force and the territories they will serve include: Paul Hayden, Charlotte, N. C.; W. H. Kissam, Jacksonville, Fla.; R. F. Heath, New Orleans; K. W. Johansson, Minneapolis; Columbus, O., W. S. Adams; V. W. Farris, New York; H. H. Jones, Philadelphia; H. B. Stallings, Chicago, and C. W. Velie, Tulsa.

♦

L. D. Smith, since October, 1936, associated with the McKeesport Tin Plate Corp., McKeesport, Pa., as general manager of sales, has been elected vice president in charge of operations, tin plate division. Previous to joining the tin plate company he had been president of Lewis Foundry & Machine Co., a subsidiary of Blaw-Knox Co. Thomas D. Douglas has been elected secretary.

L. D. Smith

♦

G. W. Pressell, executive vice president, E. F. Houghton & Co., Philadelphia, manufacturer of oils, leathers and metal working products, has also assumed the position of general sales manager. C. G. Schultze, former sales manager, Central division, has been named assistant general sales manager.

The Central division has been divided into three sections: Pittsburgh, of which D. J. Richards is sales division head; Detroit, with H. E. Martin; Chicago, with E. C. Barlow. H. E. Sanson is eastern district sales manager; W. H. Brinkley, southern division head, and A. A. Miller, western district sales manager. Departmental heads have been set up under a newly created position of research and sales manager, filled by L. D. Holland.

DIED:

■ DR. J. A. L. WADDELL, 84, one of the foremost consulting bridge engineers, and inventor of the vertical lift type of span, in New York, March 2. He was senior partner in the engineering firm of Waddell & Hardesty.

♦

Clarence O. Waldron, 60, for 30 years head of the Waldron Sheet Metal Co., Madison, Wis., recently.

♦

W. R. Collins, 53, Chicago district salesman for General Cable Corp., at his home in Evanston, Ill., March 6.

♦

James S. Sloan, president, International Supply Co., Tulsa, Okla., in that city, Feb. 21.

♦

Edward Graves, 75, president, American Pipe & Steel Corp., Alhambra, Calif., in Glendale, Calif., Feb. 23.

♦

Henry Clayton Macaulay, 83, founder of H. C. Macaulay Foundry Co., Berkeley, Calif., at his home in that city, Feb. 22.

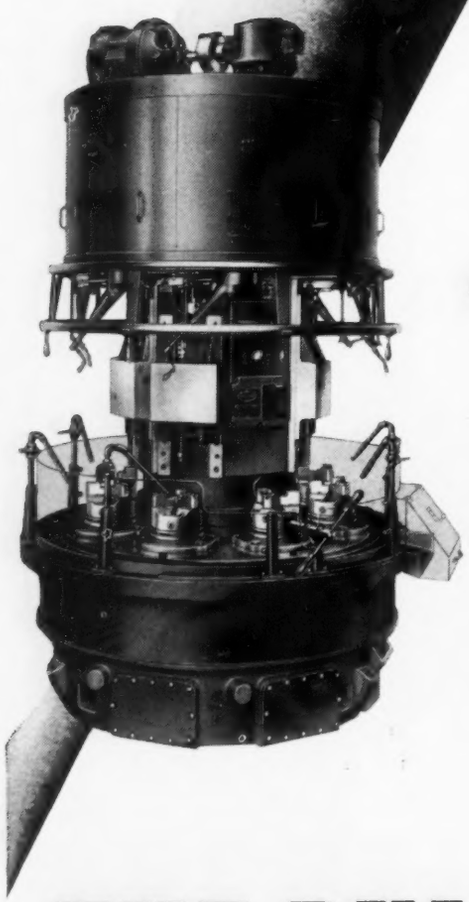
♦

Joseph W. Kuesser, 45, vice president, Knapp-Monarch Co., St. Louis, manufacturer of electrical appliances, in that city, recently.

♦

William Raynor, 60, purchasing agent, Otis Elevator Co., New York, in New York, March 2. He had been affiliated with the Otis company 30 years.

CRAFTSMANSHIP IN YOUR PRODUCT



Via the MULT-AU-MATIC MACHINING METHOD

Craftsmanship . . . real Craftsmanship . . . in any product is desirable from the standpoint of durability and long life at Low Cost.

Accuracy and finish on parts subjected to high speeds and hard service are essential.

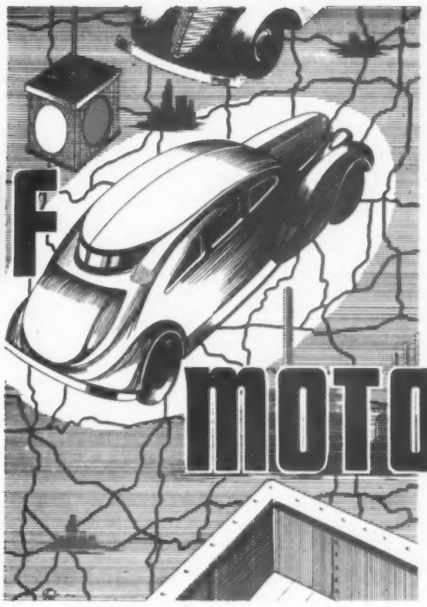
Finish and close fits on other parts provide smooth running and eliminate vibration.

Therefore, Craftsmanship on your work means better products. But, How Craftsmanship at Low Cost? BULLARD MULT-AU-MATICS. Through their design and construction, they naturally produce craftsmanlike work. Through their machining method, they produce this work at Low Cost. Let us tell you how Mult-Au-Matics can Lower your costs. Then, consider this equipment as Replacement units.

THE BULLARD COMPANY

BRIDGEPORT CONNECTICUT

MIRRORS OF MOTORDOM



DETROIT

■ BONFIRES blazed merrily throughout the country last week as thousands of decrepit "jaloppies" were towed to a final resting place, soaked with kerosine and ignited. In Philadelphia a pile of 150 obsolete cars went up in flames; in San Francisco "junkers" pyres studded the hills of the Bay region; and in Detroit the north end of Belle isle was the scene of a huge conflagration.

In Washington a Goodyear blimp sailed over the city with a derelict car suspended by cables from the cab. At the city limits it was dropped on a pile of several hundred other rusted wrecks and a torch applied to the heap. No word has been received as to how much scrap iron neighborhood dealers were able to scrape up from the embers, but at present prices the salvage would hardly be worth the effort.

Sheer bulk of the industry-wide advertising campaign to stimulate used car sales was probably the best promise of its success. So inspired was one retailer of men's clothing here that he released advertising suggesting a "national used clothes elimination week." Several of the leading automotive parts suppliers joined in the campaign and sponsored newspaper ads spurring the drive onward.

Ford Reports Sales Up

As to results, late last week no figures were available from either General Motors divisions or Chrysler divisions. Telegraphic reports from 36 domestic branches of Ford on results of the opening day of the campaign showed sales three times the daily average for the preceding 10-day period—10,000 against 3400. Gross sales were $2,500,000, with dealers reporting a net reduction in inventory of $1,450,000. It is also reported 40 out of every 100 sales

BY A. H. ALLEN
Detroit Editor, STEEL

were made without accepting other used cars in trade.

A Chicago Ford dealer reported sales for the first day of $9000, of which $7600 represented deals with no trade-ins. A Detroit dealer added up his first day's business and found it 800 per cent over any corresponding day's sales in the past year.

While on the subject of sales, a look at the records being established by Buick is encouraging, this interest now holding fourth place in national registrations for the first time. Buick dealers are doing a greater volume of both new and used car business this year than they did last year, although it must be remembered deliveries last year were affected seriously by the strikes prevailing in plants. However, Buick's new car sales for the first 20 days of February totaled 6029 against 3309 for the same period a year ago; used car sales were 16,437, compared with 15,033 a year ago.

Since the announcement of new models last October, Buick has registered 56,535 new cars up to the end of January, comparing with 56,123 cars in the same period a year

Grind Many Milling Cutters to Close Tolerance

■ **Closeup of inserted-tooth milling cutter being ground in tool room of Pontiac Motors division, General Motors Corp., Pontiac, Mich. From 250 to 300 of these cutters are ground daily, and faces of the teeth must be within 0.002-inch of the same height**

ago. In addition, Buick claims to have accounted for more than 64 per cent of the sales of all other cars priced at $1000 or over in these four months.

■ SUPPORTING the outlook for sharply increased production this month are figures for General Motors sales to consumers for February, March and April of the years 1934, 1935 and 1936. Last year is excluded because of the effects of strikes; 1933 is excluded because of the bank holiday and its aftermath. The figures show:

	1934	1935	1936
February..	58,911	77,297	96,134
March	98,174	126,691	181,782
April.....	106,346	143,909	200,117

If this year is to show average performance, and of course you can get plenty of argument that it will not, March sales should show sharp improvement over the February total of 94,449 which General Motors reports. If this 70-100 per cent improvement is to come in sales, then production should move up accordingly, accepting car manufacturers' statements that current production is closely geared to actual sales. And if production is to move up in this proportion, an equal increase in buying of materials and parts should develop, or already should be under way. But according to best opinion, this buying spurt has not eventuated.

Why? Failure of buying to develop can be explained by one of two reasons. Either field stocks of new cars are so high that production increases are not needed to fill expanding demand; or else car manufacturers refuse to believe a normal quickening of car buying will be felt this year. The reader may take his choice of these two possibilities.

Parts Makers Await Upturn

The condition of material and parts inventories naturally has some bearing on the outlook. Granted most car producers overloaded on steel and other materials late last summer and fall, nevertheless a good share of these stocks has been consumed, and inventories today are considered normal for present production levels, but certainly not for a production level 70-100 per cent higher. Suppliers here are watching this situation closely, expecting a break momentarily.

One steel company reports daily bookings so far this month about double the daily average for February. This same company, with a skeleton office force on duty Saturdays, experienced the unusual a week ago Saturday when so many orders were received that the force on duty was unable to transmit all of them to the plant for scheduling.

As suggested here last week, the staggered work schedule and short work-day appears to have reached its end. Briggs has expanded the work week to 32 hours and laid off about one-third of the force formerly employed. Chrysler plants have been following the same plan, and others likely will follow suit. The consequent improvement in manufacturing efficiency should improve the financial showings of these producers, and at the same time those now working the longer week will receive more of a living wage. Despite protestations of the UAW, the men concerned have voted almost unanimously in favor of the new plan.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	†1937	1938
Jan.	377,244	399,186	228,074
Feb.	300,810	383,900	*220,000
March....	438,943	519,022	.....
April.....	527,625	553,231	.....
May.....	480,518	540,377	.....
June	469,368	521,153	.....
July.....	451,206	456,909	.....
Aug.....	275,934	405,072	.....
Sept.....	139,820	175,630	.....
Oct.....	230,049	337,979	.....
Nov.....	405,799	376,629	.....
Dec.....	518,958	346,886	.....
Year	4,616,274	5,015,974	.....

*Preliminary.

†1937 figures revised.

Week ended	
Feb. 12	57,810
Feb. 19	59,100
Feb. 26	56,977
March 5	54,440
March 12	57,438

	Week ended Mar. 12	Mar. 5
General Motors	24,500	23,750
Chrysler	13,475	11,150
Ford	12,060	11,500
All others	7,403	8,040

■ NOVEL method of fastening screws into sheet metal has been taking the automobile industry by storm and will be used extensively on next year's models for the fastening of fenders, striker plates, roof bows, dovetails, wiring harness, sun visors, door handles and hinges and the like. The fastening system can be incorporated in the sheet metal itself or a separate fastener supplied, avoiding the use of nuts and other fastening devices.

Developed and patented by Prestole (pressed-hole) Devices Inc., Detroit, what the method involves essentially is the use of a specially shaped hole in the metal or fastener at the bottom of a cone-shaped depression formed into the metal by a special combination punch which, in addition to depressing the metal and punching the hole, slits the metal back from the hole a short distance from its edge. Variations in the separate fasteners include snap-on type, clinch-on type for heavy assemblies and the track type for accommodating multiple screws.

General Motors divisions are using the fastening system on both body and chassis work, and a large mail-order house has adopted the method on assembly of household equipment such as refrigerators, stoves, washing machines, cabinets and the like. Appreciable savings in assembly labor costs are obvious when it is considered how quickly and easily the device can be snapped into position to hold with a reputed equal or greater strength than the conventional type of nut.

■ DOMESTIC appliance business in this district is showing a good improvement this month over last. Parts releases by one manufacturer here for March indicate a rapid acceleration of production to meet spring demand. A vacuum cleaner company executive here noted recently a substantial improvement in sales, especially of the higher priced equipment in his line. The Norge expansion at Muskegon Heights, Mich., is in anticipation of sharply increased production of refrigeration equipment later in the year.

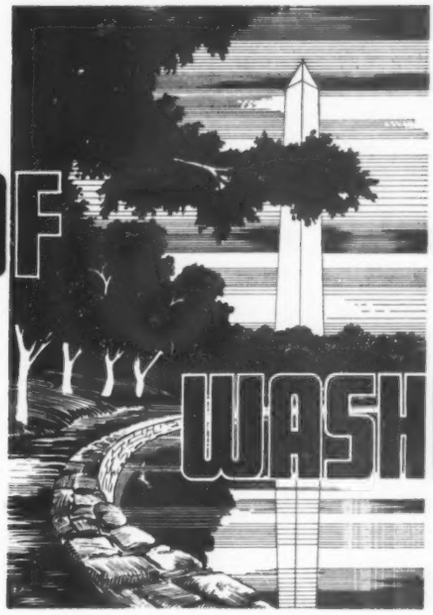
Continental Motors Corp. at Muskegon added 300 men to the payroll during February and has experienced encouraging pickup in motors and accessories business, especially from manufacturers of agricultural implements.

Packard schedules call for about 6500 jobs this month, in comparison with 4200 produced in February.

After a week's shutdown—the first this year—Lincoln assembly lines were scheduled to resume last week at a rate of 100 cars per day for five days, somewhat below the 150-a-day level adhered to until recently. Hupmobile and Graham assembly lines continue idle, with resumption indefinite.

New model die work continues to filter slowly into the larger tool and die shops here, although it is disappointingly slow. Die work recently placed with Toledo and Dayton, O., companies, is understood to have been recalled for some unexplained reason. Die shops here are in process of negotiating with the various unions which have members in their shops, with a view to renewing contracts for another year before the present agreements expire. This is to avoid any possibility of a tieup in May when most shops expect to be in their rush season.

WINDOWS OF WASHINGTON



WASHINGTON

■ THE STEEL industry seems more aroused over the United Kingdom's trade agreement hearings which will begin March 14 than at any Washington hearings since NRA days, if the number of appearances means anything. More than 400 persons and organizations have notified the government they will be represented at these hearings which will last some ten days with the steel industry led by the American Iron and Steel institute.

In an announcement made last week, Henry F. Grady, chairman of the committee for reciprocity information, who will conduct the hearings, stated that because of the large number of witnesses who desire to be heard the sessions have been extended beyond the customary period.

Members of congress and municipalities will be given an opportunity to appear at a general session March 14 and 15. Beginning March 16 the hearings will be divided into groups to expedite them. The steel industry is to be heard March 17.

Steel Well Represented

In connection with the steel industry the following appearances have been filed up to the present: American Iron and Steel institute, New York; tariff committee, tool and fine steel industry, including A. T. Galbraith, Crucible Steel Co., Syracuse, N. Y., Flody Rose, Vanadium-Alloys Steel Co., Latrobe, Pa., and J. Heber Parker, Carpenter Steel Co., Reading, Pa.; Rustless Iron & Steel Corp., Baltimore; Metal Window institute, Washington; Valve and Fittings institute, New York; Association of Sprocket Chain Manufacturers, Chicago; Association of Roller and Silent Chain Manufacturers, Indianapolis; Harte & Co., New York, with J. van der Voort; Mystic Iron Works, Boston, with T. W. Kennedy; American Manganese Producers association, Washington, with J. Carson Adkerson; Cuban-American Manganese Corp., New York, with Langbourne M. Williams Jr.; Boulder County Tungsten Producers, Boulder, Colo., with William Loach; and American Tungsten association, San Francisco.

BY L. M. LAMM
Washington Editor, STEEL

AUSTRALIAN TRADE PACT INDEPENDENT OF ENGLAND

Secretary of State Hull is active on his trade agreement program. The latest word here indicates that plans looking to the negotiation of a trade agreement with Australia are under discussion.

As is well known, the state department is in the midst of negotiations with the United Kingdom and Canada. It is understood in well informed circles, however, that any pact which might be made with Australia would be independent of that with the United Kingdom, as the dominions are being dealt with separately.

For a long time, goods from the United States were practically embargoed by Australia, but that situation was eased in December when the Australian government abolished certain import restrictions that were considered in Washington as discriminatory against this country. This has led to opening of conferences recommending the possibility of a trade agreement, which was climaxed at a conference last week by the President, Secretary Hull, and other government officials.

After considerable negotiation, the agreement between the United States and Czechoslovakia was concluded here last week. This was disliked by American shoe manufacturers because Czechoslovakia has been flooding the market with cheap shoes for years. The shoe manufacturers put up a fight, but the state department allowed importations at the same rate of duty as at present, but in somewhat restricted quantities. There is nothing in the agreement of vital interest to the steel industry.

EXPORTS TO CANADA SHOW LARGE INCREASE IN 1937

In view of the fact that the trade agreement with Canada will be reopened for further negotiations within the next month a computation by the department of commerce of our trade with that country is of interest.

It shows that substantial gains in exports of a large number of metals and manufactures contributed to raise the total value of shipments in this group of products from $36,000,000 in 1936 to $61,400,000 in 1937.

It is pointed out that a large part of our exports to Canada consists of non-metallic metals, manufactures of metals for machinery and vehicles. These three major groups accounted for $92,000,000 of the total increase of $125,000,000 in the value of United States' exports to Canada in 1937, compared with the previous year.

The figures show that exports of agricultural machinery and implements increased from over $11,200,000 in 1936 to $18,700,000 in 1937. Equally large or larger relative increases over 1936 occurred in exports of a number of other machinery products with a result that the total for the entire group for machinery and vehicle exports increased from a value of $94,400,000 to $139,600,000 in 1937.

FEDERAL LICENSE LAW WOULD DELAY RECOVERY

Any attempt to further regulate American business through passage of a federal licensing bill will reduce present employment and retard recovery for an appreciable time, a senate judiciary sub-committee was

told last week by a business man.

The witness was Elmer T. Cunningham, New York, acting chairman of the National Association of Manufacturers committee on government relations to industry, and former president of the Radio Corp. of America Mfg. Co.

Mr. Cunningham attacked the bill as not only dangerous to economic recovery, but entirely void of any foundation or excuse.

"All efforts at this time must be directed towards permanent recovery and increasing employment," he told the committee. "That is the vital task all of us face. To place hundreds of thousands of businesses under licensing investigation will retard, not aid, recovery. Regardless of merit or demerit, this is not the time to make this bill the law of the land."

He estimated that more than 300,000 business enterprises would be required to obtain federal licenses to remain in business if the bill becomes a law.

"To investigate and supervise 300,000 businesses, and the actual figure may be considerably larger, is a huge task," he declared. "The interstate commerce commission's task of regulating railroads is small in comparison.

"In these critical times business and government must co-operate in a common objective. Recovery must be accomplished by American businessmen. The profit incentive is the all-powerful driving force in American business life. Not the certainty of profits but the opportunity for profit will stimulate millions of individual enterprises to expand their operations, to create new products, to modernize plants, to risk 'venture' capital."

PATENTS LICENSE TIED IN WITH MONOPOLY PROBE

The McFarlane compulsory patents licensing bill has taken on more than ordinary interest. Apparently administration officials are tying it up with the whole monopoly question.

When asked at a press conference last week for his attitude on the bill, Secretary of Commerce Roper stated that he did not care to comment on it at this time. He stated that the bill had been referred to the attorney general for consideration with the whole question of monopolies, which he is now working on with other government officials, at the request of the President.

It is apparent that the administration is going into every phase of the monopoly situation when it goes so deeply into the patent law in connection with a proposed bill.

There is still considerable speculation in Washington as to just what will be done by the President on the monopoly question. Some newsmen feel that the President has given up the idea of sending a special message to congress on this subject, while others are as insistent that such a message will go forward soon. There is every indication, however, that the President is giving the matter earnest consideration and the well-informed are of the opinion that any legislation to be passed at this session will ask for a thorough study of the situation rather than for any immediate legislation.

STEEL LEADERS TELL OF PUBLICITY PROGRAM

Officers of the National Association of Manufacturers were heard recently by the LaFollette committee investigating industrial relations. A picture was presented of the association's activities. Information was given by Charles R. Hook, president, American Rolling Mill Co. and president of the association; Ernest T. Weir, chairman, National Steel Corp., and chairman of the national industrial information committee of the association; Walter B. Weisenberger, executive vice president of the association; Noel Sargent, secretary of the association and director of its employment relations department.

Mr. Weir's national industrial information committee was organized three years ago to obtain the financial support of manufacturers to a nationwide public information campaign to carry facts about industry to the public.

This program was launched in February, 1934, when manufacturers came to the realization that for years they had neglected to supply facts about the industrial system to the people while many groups had consistently carried on propaganda against industry.

The keynote of this program has been that: First, it was the duty of each manufacturer constantly to improve and modernize his relations with his employes, stockholders, consumers and the general public; and, second, it was his duty to help eliminate misunderstanding by "taking the mystery out of business" through presentation of his story to the public.

MANGANESE STOCKPILE NECESSITY IS URGED

Testimony before a sub-committee of the senate military affairs committee investigating strategic minerals last week emphasized that the United States faces "a most dangerous situation" in a possible acute shortage of manganese, indispensable to making sound steel.

Testifying in support of the Miller bill, which provides for acquisition by the war department of a 1,000,000-ton stockpile of domestically-produced ferrograde manganese ore, J. Carson Adkerson, president of the American Manganese Producers association, said that indicated stocks in bonded warehouses at the end of 1937 are "astoundingly low," pointing out that stocks on hand have declined steadily each year since 1932.

Of the indicated consumption of manganese ore in the United States in 1937 of 911,563 tons, Adkerson said, probably less than 40,000 tons was domestically produced.

Senator Miller, Arkansas, explaining his bill, said he "assumed there was no argument about the need for doing something about the manganese situation from the standpoint of national defense," and that whether it is feasible to produce the stockpile from domestic manganese deposits "is the principal question."

Cites Deep Tariff Cut

Supporting his contention that domestic deposits could be developed, in time, not only to provide this stockpile but also to accommodate virtually all industrial needs for manganese, Miller read into the record the growth of domestic manganese production, during the World war period, from 2635 tons in 1914 to 305,869 tons in 1918. "Certainly the reciprocal trade agreement with Brazil, cutting the tariff on manganese virtually in half, and applying to other more important foreign sources under the most favored nation clause, has had the effect of bringing domestic production to a halt."

Representative May, Kentucky, chairman of the house military affairs committee, took part in questioning witnesses.

PLATE BANKNOTES WITH STEEL TO REDUCE WEAR

A process by which molten steel under high pressure is sprayed against banknote paper has been developed in Switzerland, according to a report from the American consulate general at Zurich, just made public by the department of commerce.

The originator of this process claims this method lengthens the life of the paper and affords greater protection against counterfeiting and destruction by fire, the report stated.

It is also claimed that the added metal does not increase the weight of the paper perceptibly nor does it diminish its flexibility.

JAPAN TAKES TIN SCRAP

The state department has announced that during February sixteen licenses were issued for exportation of tin plate scrap. All of the shipments, amounting to 1883 long tons, were destined to Japan, with a total value of $31,544.50.

Steel Distribution Statistics May Be Made Even More Useful by Further Refinement

■ ANALYSIS of the distribution of finished rolled steel in 1937, as tabulated on pages 23 to 27 in this issue, shows that the automobile industry continues to hold its commanding lead as first-ranking consumer. Buildings and railroads are closely bracketed in second and third positions, respectively, and containers fourth.

According to STEEL'S compilation, the ranking of these four remains unchanged from 1936. However, exports, which were seventh in 1936, climbed to fifth in the 1937 tabulation. The oil, gas and water classification was sixth, machinery and equipment (including electric) was seventh, and agriculture was eighth. Next in order were highways and bridges; shipbuilding and repair; and mining, quarrying and lumbering. Jobbers handled 13.28 per cent of the total in 1937 as compared with 14.13 per cent in 1936.

The distribution figures for 1937 constitute the sixteenth in a series inaugurated in 1922 when *Iron Trade Review,* predecessor of STEEL, aided by the active interest of the late Judge E. H. Gary and with the co-operation of many leading steel producers, first undertook to ascertain destination of finished rolled steel output.

Uniform Classification Planned To Avoid Discrepancies

Since the first figures were presented, certain improvements and refinements have been introduced and the co-operation of the mills has been extended to the point where in recent years practically every important steel interest has reported its distribution in painstaking detail. That the figures are considered of great value to the industry is evidenced by the interest manifested in them, not only by producers but by many consuming companies.

However, the statistics obviously are susceptible to considerable further improvement. It has been suggested that a uniform consuming classification be adopted in order to eliminate the confusion caused by the present use of one set of classifications by STEEL and a different set by another publication. At present some companies prefer one publication's classification, some prefer the other's and a few companies have adopted schedules of their own. The differences noted in the resultant tabulations in the two publications are due largely to the methods employed in adapting the figures from dissimilar schedules to each publication's classification.

Tracing to Ultimate User Favored as Complete Service

Fortunately the publications involved and the majority of the mills have indicated a willingness to agree on a uniform classification. Attempts are being made to work this out in time for use when the 1938 figures are compiled.

One important question to be considered is whether it is feasible to try to trace all finished steel to its ultimate destination, such as automobiles, railroads, etc. (which STEEL has been attempting to do), or whether it is desirable to trace certain steel only to fabricating or processing plants, such as forgers; stamped metal shops; bolt, nut and rivet manufacturers, etc. (which is the practice followed by some reporting producers).

The editors of STEEL favor the first alternative as being more indicative of the real destination of finished steel, but they also admit that their objective may be too ambitious and that it may be impractical for some producers.

Having stated this preference, they are willing to abide by the wishes of the majority of the producers, whose wholehearted co-operation has made the figures possible through these 16 years.

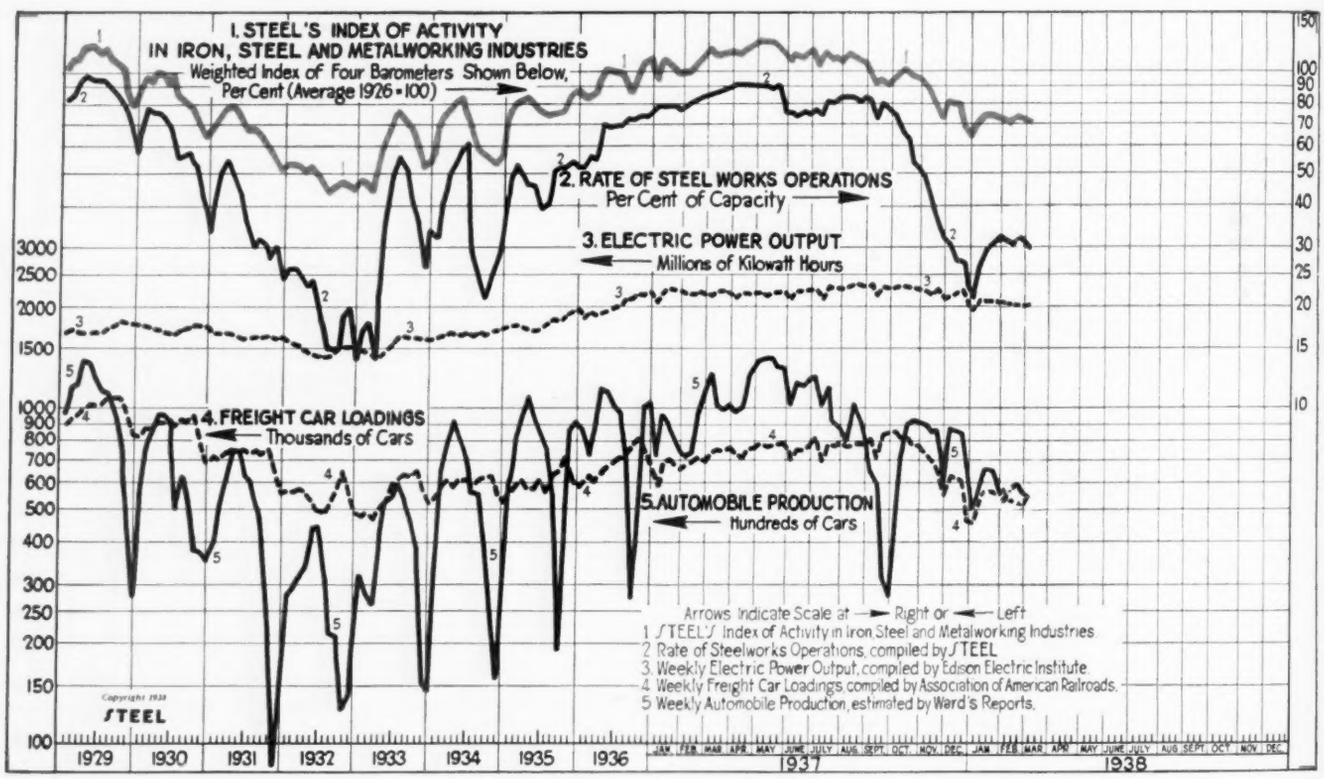
Early March Signs Are Mildly Favorable

■ CONTINUED sluggishness in activity is reflected in the barometers for the week ending March 5. A slight decline in automobile production combined with further moderate recession in the rate of steelworks operations forced STEEL'S index of activity in the iron, steel and metalworking industries to recede from 70.3 in the week ending Feb. 26 to 70.0 in the week ending March 5.

Steelworks operations again registered a moderate decline for the third consecutive week and is now placed at 29.5 per cent, 8½ points above the low of 21.0 per cent reached Jan. 1. However, seasonal influences should result in a reversal in the present downward movement of this important barometer.

Power output has improved somewhat from 2,031,412,000-kilowatt hours during the last week of February to 2,035,673,000-kilowatt hours in the week ending March 5. Carloadings showed a rather marked improvement for the first week of March, reversing the downward movement apparent through the month of February, and regaining almost all the ground lost during this period.

There are sound indications that business will improve moderately during the next few weeks, although there is little to lead one to feel that industry is prepared to move ahead on a broad scale.


1. STEEL'S INDEX OF ACTIVITY IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below, Per Cent (Average 1926 = 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at → Right or ← Left
1 STEEL'S Index of Activity in Iron Steel and Metalworking Industries
2 Rate of Steelworks Operations, compiled by STEEL
3 Weekly Electric Power Output, compiled by Edison Electric Institute
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
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1929 1930 1931 1932 1933 1934 1935 1936 1937 1938

STEEL'S index of activity declined 0.3 points to 70.0 in the week ending March 5:

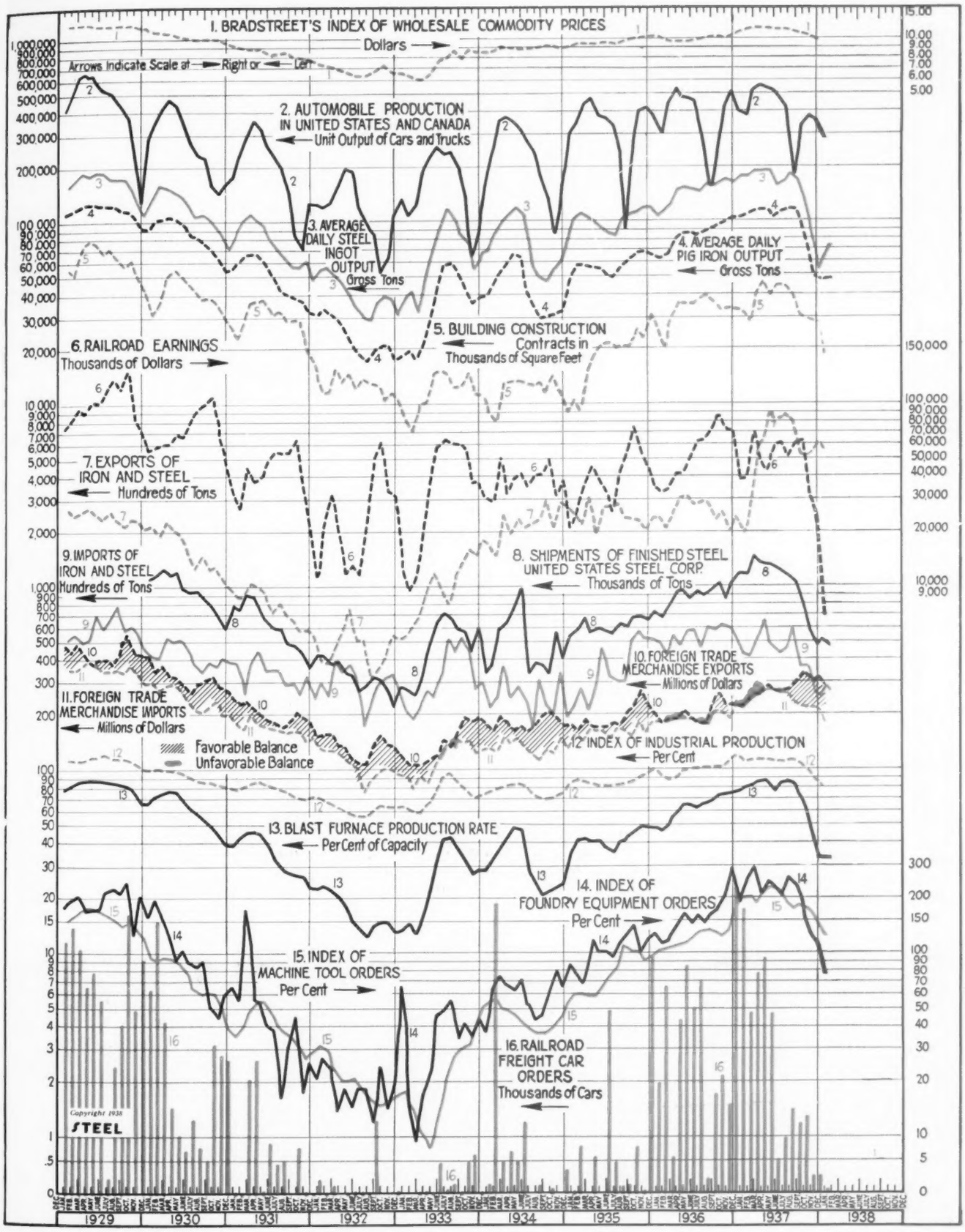
Week ending	STEEL'S Index of Activity Index No. 1937	1936	Steelworks Operating Rate Per Cent 1937	1936	Electric Power Output Million KWH 1937	1936	Freight Car Loadings 1937	1936	Weekly Auto Output 1937	1936
Dec. 4	81.5	108.4	30.5	76.5	2,152	2,243	623,337	744,957	86,173	100,395
Dec. 11	80.5	113.9	27.0	77.5	2,196	2,278	622,131	738,747	85,765	119,455
Dec. 18	79.4	114.8	27.0	79.5	2,202	2,274	603,292	729,696	82,025	121,038
Dec. 25	69.5	93.3	23.0	68.0	2,085	2,080	460,367	562,218	67,230	79,019
	1938	1937	1938	1937	1938	1937	1938	1937	1938	1937
Jan. 1	62.7	96.6	21.0	79.0	1,998	2,069	457,359	587,953	49,550	71,800
Jan. 8	70.1	107.8	26.0	79.5	2,139	2,244	552,314	698,529	54,084	96,780
Jan. 15	74.4	106.7	29.0	79.0	2,115	2,264	580,600	700,238	65,735	91,685
Jan. 22	74.7	104.0	30.5	80.0	2,108	2,256	570,333	670,376	65,418	81,395
Jan. 29	73.8	99.6	33.0	76.0	2,098	2,214	553,176	659,790	59,365	74,148
Feb. 5	70.9	100.8	31.0	79.5	2,082	2,201	564,740	675,026	51,443	72,295
Feb. 12	71.2	101.9	30.0	81.0	2,052	2,199	542,991	691,618	57,810	72,850
Feb. 19	71.9	108.8	31.0	83.0	2,059	2,211	535,790	714,884	59,100	95,698
Feb. 26	70.3	112.8	30.5	84.0	2,031	2,207	511,930†	696,727	56,977	111,915
March 5	70.0*	117.9	29.5	86.0	2,035	2,199	546,741*	734,127	54,440	126,975

*Preliminary. †Revised.

STREND

Key:	Jan. 1938	Key:	Jan. 1938	Key:	Jan. 1938	Key:	Jan. 1938
1	$9.77*	5	19,200,000	9	29,631	13	33.6†
2	228,074	6	$6,919,879†	10	$289,437,000†	14	76.8
3	70,969†	7	586,102	11	$170,763,000†	15	129.6
4	46,655†	8	474,723†	12	81	16	25

*December. †February.



Key: 1. Bradstreets' Index (Average of Wholesale Commodity Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

WHEELED TOYS

Accuracy in press operations is necessary in making toys as much as in any industrial metal fabrication; model changes are frequent and require extensive retooling operations

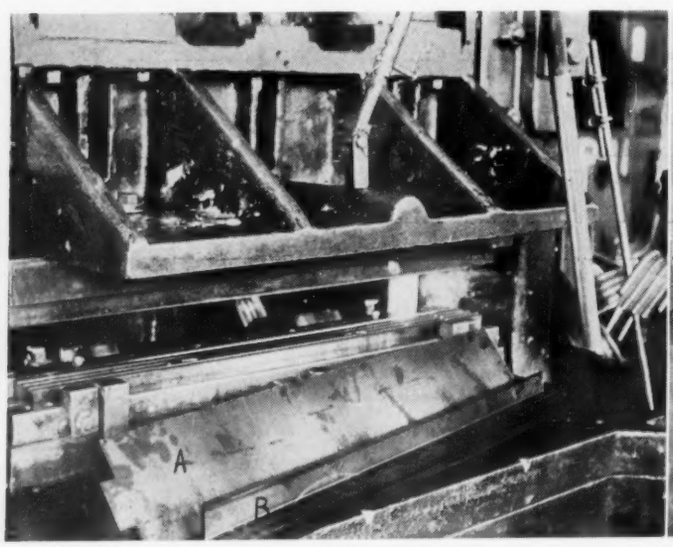
By FRED B. JACOBS

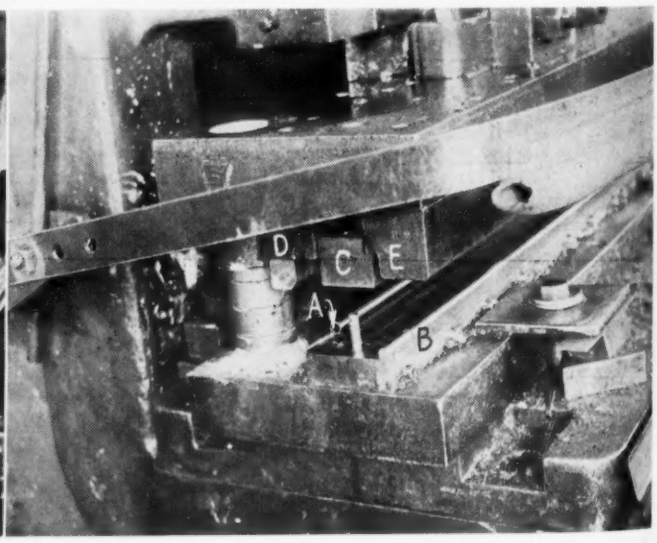
■ WHEELED toys is a trade term embracing wagons, scooters, pedal cars, and similar devices for the amusement of children. With the exception of strictly modern developments such as the scooter and the pedal car, the latter a refinement of the kiddie car of a generation ago, these goods have been on the market for the past 75 years or more. When grandfather was a little boy such toys were of wood, with metal used only where absolutely necessary as for axles, wheel bushings and tires.

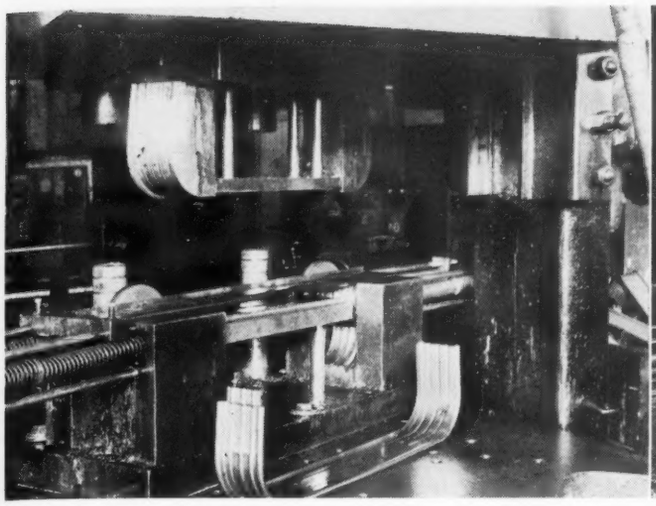
At the present time most wheeled toys are of sheet steel, of 20 to 26 gage, resulting in toys that are comparatively light and durable and take a rapid and pleasing finish. In this branch of the toy business substantial plant equipment is necessary, the most expensive items being presses of the geared variety and accurate, intricate dies, the latter being the products of expert die designers and die makers. In accuracy these dies compare favorably with those used in making precision parts for such units as cash-registers, adding machines and typewriters.

A typical plant devoted to production of wheeled toys is that of the Dayton Toy & Specialty Co., Dayton, O. It is housed in a modern 2-story building with approximately 50,000 square feet of floor space, with production lines so arranged that the work flows through the plant with practically no back tracking. Raw materials consist of sheet steel for bodies, sheet channel shapes from which wagon

Fig. 1 (left) shows die setup for embossing steel toy wagon sides and ends; A and B show the stock before and after this operation. Fig. 2 (right) shows the stock with one edge curled into a full circle, A, and the other into a half round and projection. As upper die descends the center section, C, remains in place while the curling and forming is done by the outer sections, D and E







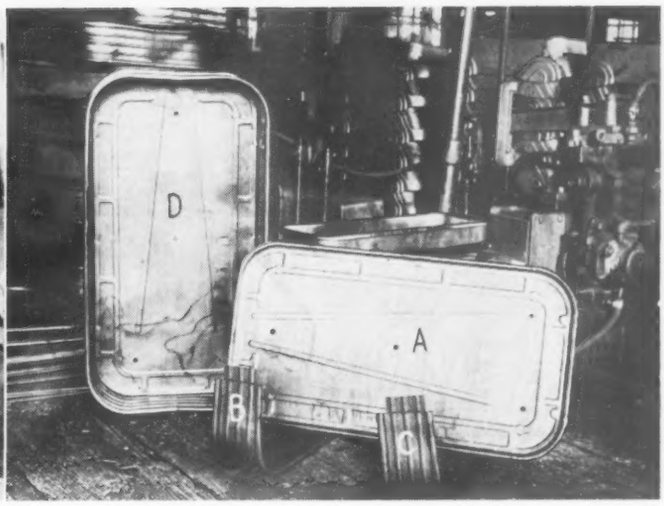


Fig. 3 (left) shows the bending operation in forming wagon sides and ends. Fig. 4 (right) shows a wagon bottom, A, wagon sides and ends, B and C, and a completed body, D

bolsters are made, wire rods for axle stock, flat bars, rubber for tires and a certain amount of wood used for wheelbarrow handles. All materials are received in an enclosed bay served by a railroad siding.

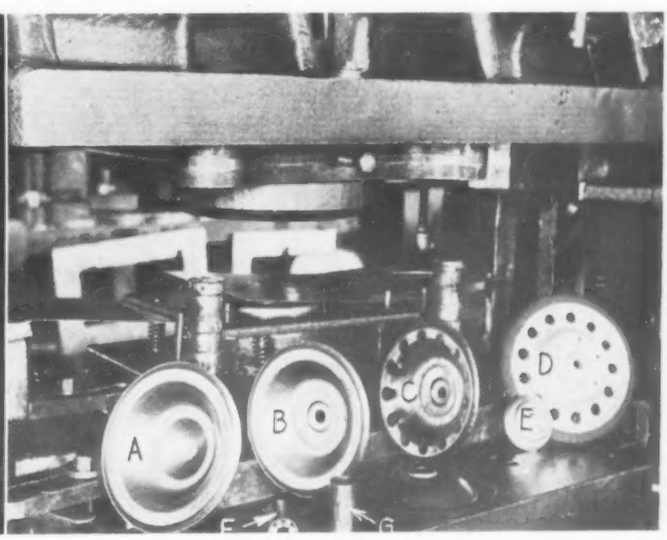
Many interesting press operations are performed, especially in making bodies and wheels. Bed sizes of the wagons are from 17½ inches long, 8¾ inches wide and 2¾ inches deep to 35 inches long, 15 inches wide and 4¾ inches deep; hence, comparatively large dies are necessary, necessitating long production runs. Dies are of the pillar type, assuring alignment at all times and reducing setting up time. Dies shown in Fig. 1 are for embossing the stock which will form wagon sides and ends. The piece of stock, *A* has been notched at one end in a previous simple press job. The embossing operation throws up three lengthwise corrugations which stiffen the body and add to its attractiveness. At the center of the stock a panel is formed on which the trade mark subsequently is stenciled; in addition one side is bent at an angle of 90 degrees; *B* in Fig. 1 shows the stock after this operation. In Fig. 2 is shown the next operation with one edge of stock curled into a full circle, *A*, the other edge, formed into a half round and a projection, *B*. In the operation of this die the center member, *C*, comes in contact with the stock holding it firmly in place. Then as the upper die descends the center member remains still. The curling and forming is done by the outer and inner members of the upper die, shown at *D* and *E*.

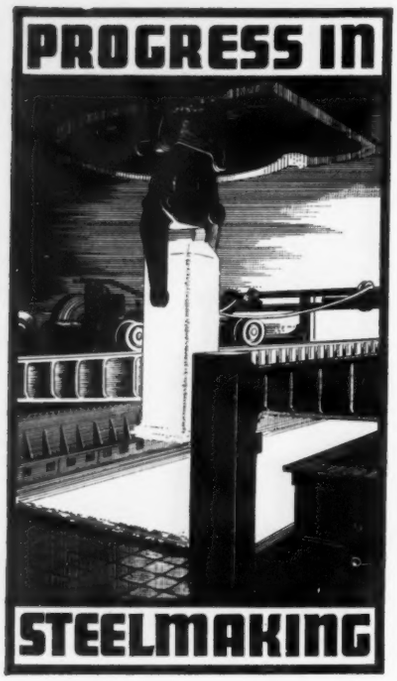
In the next operation the stock is bent endwise to form the ends, thus forming one half of the body. This operation is shown in Fig. 3 with the flat stock in place in the die and the finished part in the foreground. As the punch descends it forces the stock to conform to its shape. There is no lower die; at each end is a grooved roller to fit the corrugations and the action of the punch forces the stock past these roller faces. As the upper part of the piece is curled into circular form, the observer who has had experience in bending tubing under any conditions appreciates that this is an unusual and clever bending operation. Stock comes from the dies with no sign of the wrinkling that often is characteristic of the work of poorly designed dies.

A wagon bottom is shown at *A*, Fig. 4. It is blanked and formed

(*Please turn to Page* 58)

Fig. 5 (left) shows the spot welding operation in making joints in wagon bodies. Fig. 6 (right) shows a wheel blank, A, with roller bearing seat, center hole and spoke holes, B and C, and completed and fitted with tire, D; shown also are hub cap, E, and roller bearing and roller bearing shell, F and G





Lubrication

Low viscosity and high film strength lubricants are now being employed on high speed mills for the purpose of conducting away the heat developed by friction

By C. C. PECU
Lubrication Engineer,
Lackawanna Plant,
Bethlehem Steel Co.
Buffalo

■ AS FAR AS IS possible, the machinery for the modern steel plant is designed for oil lubrication. In spite of this, bearings lubricated with grease are still outnumbering those using oil.

Gears and pinions in the new high-speed mill require a lubricant with the lowest possible viscosity and the highest film strength attainable. This is for two reasons, to permit easy application of the lubricant to the meshing parts of gears and pinion teeth, and to provide a medium that will carry away the heat developed. A straight mineral oil is admittedly best suited to dissipate the heat, provided it has the required film strength. Many EP (extreme pressure) fluid greases on the market today have a lower viscosity and higher film strength than the ordinary oils and are doing excellent work.

These EP fluid greases are used in many mills where centrifuges are employed in the filtering system. As time goes on their use may be extended, particularly if they can be made more water resistant, and provided the EP content can be made more stable.

Instead of roller bearings employed in many mills the modern strip mills are using many oil-lubricated bearings on the backing-up rolls, lubricated with an oil of 2200 seconds viscosity at 100 degrees

Table I

Cup Greases

APPLICATION	TYPE OF LUBRICANT
Ordinary grease cups	Conventional type; with oils of low viscosity and low flash point and with soap content according to penetration point.
Hand guns and pressure systems:	
1—For high-speed light work	Grease with low cold test, low-viscosity oils and a small amount of soap. Penetration point 365, unworked.
2—For heavy and hot work	Grease with oils of high viscosity and high flash, and with low soap content. Penetration point 250, unworked.
Roll neck greases for hand-packed mills, babbitt bearings.	Hard grease with oils of high viscosity and high flash; high tallow and soap content, and 7% graphite. Penetration point 56, unworked.
Soft grease for pressure greasing system, babbitt bearings.	High-flash low-viscosity oil, high tallow and low soap content with 7% graphite. Penetration point 220, unworked.
Hard grease for hot neck hand sheet mills.	Heavy asphalt stock oil, 9% Bentonite; 3% Degra with a 700 seconds viscosity at 210 degrees Fahr. instead of mixing grease.
Soft grease for roll neck roller bearings.	High-viscosity, high-flash oil with not over 3% E. P., 3% sulphur or 7% lead. Penetration point 250, unworked.
	PINIONS
Open housings.	Several densities to fit speed of mills, from 1750 to 6000-seconds viscosity at 100 degrees Fahr., asphalt stock.
Closed housings.	Use the foregoing as base. Cut back with 145-seconds viscosity at 210 degrees Fahr. S. R. (steam refined) cylinder oil; in no instance must both be over 3200 seconds viscosity at 100 degrees Fahr.
Soda base transmission grease.	With low-viscosity medium-flash and low cold test oils with 5% graphite. Penetration point 300, unworked.
E. P. lubricants.	With low-viscosity medium-flash and low cold test oil, E. P. content not over 7%. According to speed use 1300 to 3600 seconds viscosity at 100 degrees Fahr.
Mill reduction gears.	Soda base transmission grease, low-viscosity, low cold-test, medium-flash oils, 5% graphite. Penetration point 360, unworked.
E. P. leaded lubricants.	Same as used in pinion cases.
Roller bearings, light and high-speed mills.	Low-viscosity low cold test oils and low soap content, penetration point 365, unworked.
Roller bearings for heavy and hot work.	High-viscosity and high-flash oils and small amount of soap. Penetration point 230, unworked.
Worm drives on mill screws.	High-viscosity, medium-flash and low pour test oils with varying E. P. content according to the type of E. P. used; viscosity at 100 degrees Fahr. not above 2600 seconds.
Mill screws.	Same as for worm drives, except a more viscous product. Not over 4200 seconds at 100 degrees Fahr.

What is CHEMICAL LEAD

ACCORDING to the American Society of Testing Materials "Chemical Lead (Grade H) is a designation that has been used for many years in the trade to describe the undesilverized lead produced from South East Missouri ores". Since the Civil War the St. Joseph Lead Company has been producing lead from its own mines in South East Missouri. This lead early became known as Chemical Lead owing to the unique properties which it possesses, and which account for its extensive use in the Chemical Industries. St. Joe Chemical Lead is obtained by the direct reduction of South East Missouri ores to which no scrap or secondary materials are added, insuring an unusual uniformity of physical and chemical properties.

As can be seen from the analysis it contains a percentage of copper and a small amount of silver and nickel. These elements combine to give the lead an extremely low creep rate under steady stress and a high resistance to the corrosive action of sulphuric acid and other chemicals. These properties are also desirable in sheathing for cable, and account for the extensive use of St. Joe Chemical Lead in the Cable Industries.

TYPICAL ANALYSIS OF ST. JOE CHEMICAL LEAD	
Silver	.0100%
Copper	.06
Bismuth	None
Zinc	.0003
Iron	.0005
Arsenic-Antimony-Tin Combined	.0012
Cadmium	.0023
Nickel & Cobalt	.0046
Lead by difference	99.92+

ST. JOSEPH LEAD CO.

250 PARK AVENUE • NEW YORK • ELdorado 5-3200

Fahr. Here is a real opportunity for an EP fluid grease of low viscosity and high demulsibility. With somewhat higher EP qualities than those of the 2200-seconds viscosity oil, the viscosity could be lowered 50 per cent, insuring easier filtration. Such a grease, if developed, should become widely used.

During the past years many greases have been developed which have replaced oils in steel mill operations. The majority of the older types of mills were designed for extensive use of grease. These older mills had open pinion housings and open table lineshaft gear drives and hard grease was used on the roll necks. Today pinions are enclosed in housings, table lineshafts run in machined cases and roll necks are lubricated with soft grease applied through an automatic greasing system.

Experience has demonstrated that failures are not always due to wrong lubricants but that the responsibility can frequently be traced to faulty methods of application. A high-speed gear, for instance, can be ruined by carrying the bath too high; the wear on pinion teeth is greater if the bearings wear rapidly, allowing the pitch line to change; a high-speed roller bearing is sometimes ruined by filling it too full of grease.

Experience has taught the author to use as soft a grease as possible, because it allows more instant lubrication, thus saving bearings and cutting down the power loss. The general aim also should be to use as few greases as possible. The data shown in Table I represent the common types required in steel mill lubrication.

Application of lubricants to a blooming mill and a large bar mill is presented in detail in Table II.

Data in Table II contains the complete list of greases used in the following mills: All sizes of blooming, structural and rail mills; and 24, 14, 12, 10 and 8-inch bar mills. The pinions and reduction gears of all these mills work in a grease bath, the density of which is regulated to the mill speed. Roll necks on all mills except the bar mills have pressure greasing system.

Hot and cold saw roller bearings should be run on a low-cold test, low-flash, low-viscosity oil, with low-lime soap content and penetration point of 365, unworked. This is also used for electric motor roller bearings except in extra hot places where a soda-soap, medium-viscosity and flash oil is used, with penetration point 320, unworked.

Table II
Application of Lubricants

BLOOMING MILLS

SOURCE	TYPE OF LUBRICANT
Heating Furnace Cranes:	
1—Greases.	For all sleeve babbitt bearings use a high viscosity, high flash test oil with low lime soap content, penetration point 240, unworked.
2—Truck wheel roller bearings.	Same grade of grease as in 1.
3—Gears.	Asphalt stock with proper viscosity to suit speed and heat conditions.
Heating Furnace Cover Journals:	
1—Open type.	Heavy high melting point grease that will melt to a jelly in use.
2—Roller bearings.	High-viscosity, medium-flash oil, low-soap content grease. Penetration point 240, unworked.
Mill Approach Table Bearings, (plain and roller).	High-viscosity, high-flash oil and low-soap content grease, penetration point 250, unworked.
Lineshaft Drive Gears:	
1—Open.	Asphalt stock, 4000-seconds viscosity at 100 degrees Fahr.
2—Closed.	Asphalt stock, 2000-seconds viscosity at 100 degrees Fahr.
3—Manipulators.	For general lubrication, high-viscosity high-flash oil, lime-base grease, penetration point 250, unworked.
Manipulator Reduction Drive Gears.	Soda base cylinder stock transmission grease, penetration point 360 to 390, unworked.
Mill Pinions, Teeth.	Asphalt stock of 5000-seconds viscosity cut back to 3000-seconds viscosity, with S. R. (steam refined) cylinder oil by action of neck oil leaking into case with an overflow holding the level of both to about three-quarters the length of tooth.
Modern Pinions, Housings and Neck Bearings, (oil sealed away from bath).	Soda base transmission grease, with a high-viscosity, low-test oil with 5% graphite. Penetration point 320, unworked.
Mill Roll Necks:	
1—Hand packed.	Conventional type hard grease, high-tallow content, high-viscosity and flash oils with not over 7% graphite, penetration point 56, unworked.
2—Pressure greasing system for babbitt bearings.	Soft grease with high-flash, low-viscosity oil, high-tallow content with 7% graphite. Penetration point 220, unworked.
Runout Tables:	
1—Necks, plain and roller.	Same as for approach table.
2—Lineshaft gears.	Soda base transmission grease, penetration point 360, unworked. This type has great value here as it is not contaminated with water and scale as at the approach table.

MODERN BAR MILL

SOURCE	TYPE OF LUBRICANT
Mill Tables.	Same as at the blooming mill.
Reduction Gears.	Soda base transmission grease, low-viscosity, low cold test oils with 5% graphite. Penetration point 340, unworked.
Mill Pinions.	Soda base grease, low-viscosity, low cold test oils with 5% graphite. Penetration point 190, unworked. Cut back with neck oil to about 2400-seconds viscosity at 100 degrees Fahr.
Roll Necks, Babbitt Bearings.	Soft roll neck grease with penetration point 220, unworked, and 7% graphite.
Flying Shears (revolving):	
1—Roller bearings.	Low-viscosity and cold-test oil with low soap content. Penetration point 365, unworked.
2—Reduction gears.	High-speed E. P. lead soap, low cold test grease, viscosity 3000-seconds at 100 degrees Fahr.

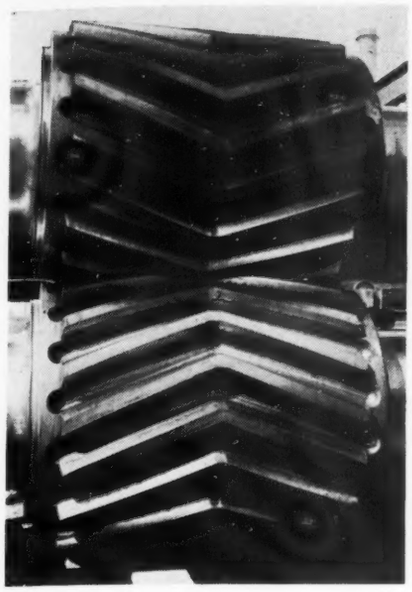
Waterproof Grease Required

The great need in the modern hot strip mill, where water is used in large quantities and under heavy pressure, is a waterproof grease, in several densities; if available at a fair price, waterproof greases would lead all other greases in volume. Table roller baths are constantly flooded, washing the lubricant off the gears; strip coilers are deluged with water, to keep the machinery cold. Water enters into bearings and gear cases, emulsifying and flooding out the grease and oil. In most mills the mill work roller bearings are frequently exposed to water, the greases are emulsified, and the rollers and races of the bearings are etched. Some of the greases available today are, in a great measure, waterproof, but this is not general, and it should, therefore, be the aim of all greasemakers to remedy this situation. Water and roll scale present the greatest difficulties in connection with the lubrication of a steel plant. Both are always present, and efficient precautionary measures are rewarded by savings in maintenance cost and fewer delays in the operations.

Special Purpose Greases

For certain specific purposes high-melting point greases are needed, such as are used on pushers and levelers of coke ovens, on charging cranes at open-hearth furnaces, and on runout tables for hot strip mills. These should be lubricated with a No. 3 cup consistency high-flash and viscosity oil with 4 per cent graphite.

Cold water plunger grease, while not in demand in any great volume,



Because of carefully supervised lubrication these large herringbone pinions show practically no wear after many years of service

must be used in every mill. The aim is to have a soft, plastic grease which will lubricate the packing, without dragging, and adhere to the plunger.

Greases cannot function properly without care in application. If care is not taken, foreign matter will gradually enter the bearing. Consequently, much more grease generally is used than is required for actual lubrication. Some hot strip mills, for instance, are sealed; these will use three barrels per week, or less, on 12 stands. Others, not as well sealed, use as high as seven barrels per week. Even with this great quantity, water and pepper scale will enter. Grease always gives the best results in a mill when applied automatically—a small quantity at stated intervals.

The greases consumed in the largest quantities, in a plant where all types of mills are in use, are roll neck greases, generally heavy-duty and hot-service greases, and light-duty and high-speed greases. Leaving out the hand sheet mills, the roll neck greases represent the smallest quantity of the three types.

Effect of Cold Weather

Greases should also be changed to suit the season. In the Lake Region the great danger lies in using too heavy a grease. A test was carried out on duplicate machinery for a period of 18 months, with weekly power readings. The changes in the friction load caused by cold weather were astonishing. By application of the proper greases most of the peak loads were eliminated through this study.

Summing up, a steel plant may be lubricated with comparatively few types of grease, and at a low cost. The ordinary greases of today will serve in practically all instances, with EP (extreme pressure) lubricants being used only in exceptional cases. Analyses of typical lubricants are given in Table III. These analyses are not complete; they merely include the general type of oil, soap, and EP content, and penetration point. Melting points have not been given, as this point always differs considerably, depending upon the person who makes the observation.

Use Alloy Iron

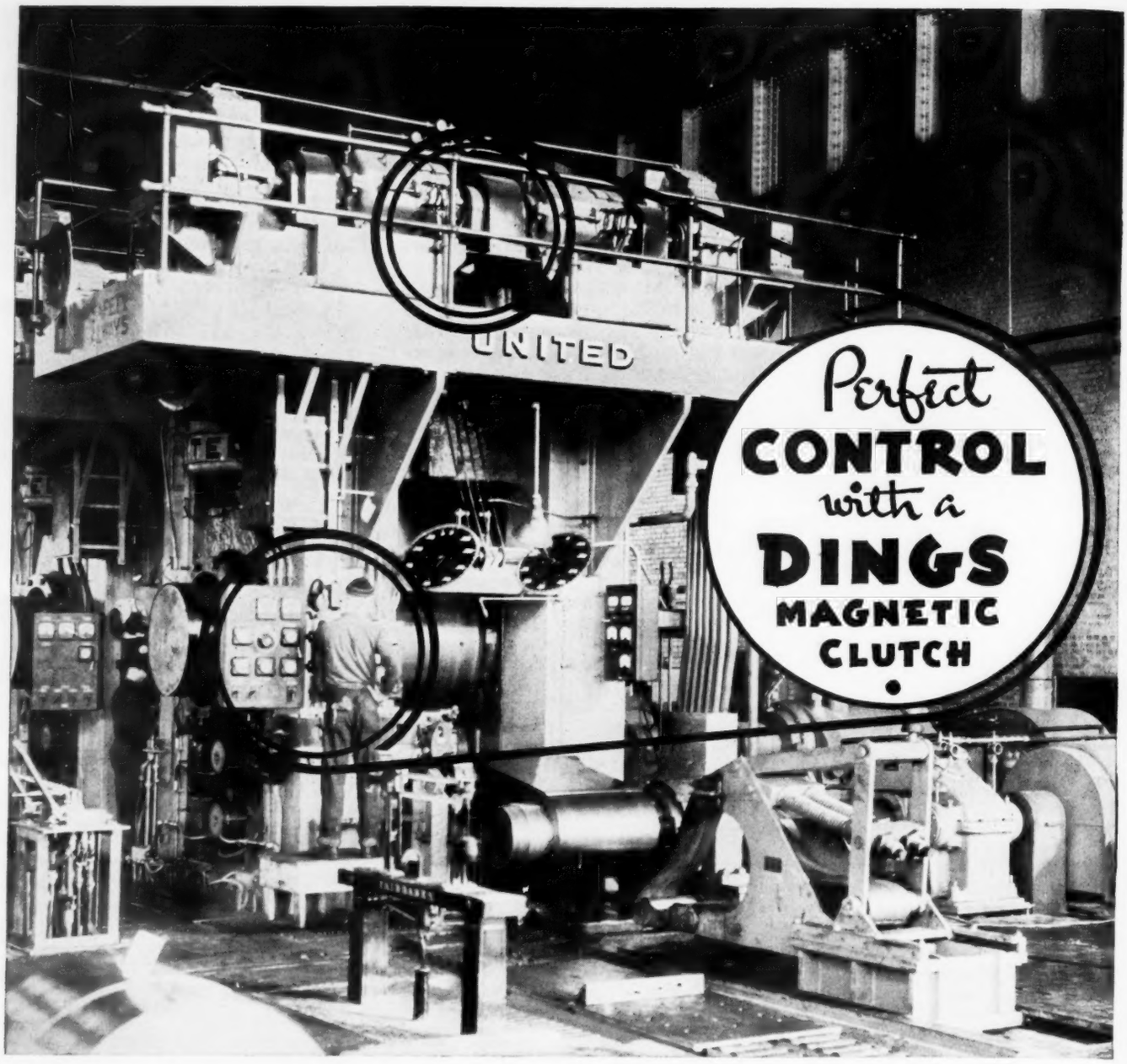
■ After a sound mechanical design has been achieved, efficient operation of automatic coal burning equipment depends on the ability of a few parts to withstand the ravages of heat and abrasion, according to W. T. Sheffield, Hershey Machine & Foundry Co., Manheim, Pa., in an article in the January, 1938, issue of *Nickel Cast Iron News*. To assure trouble-free operation, coal tube and top burner rings of this company's Motorstokor now are protected by the addition of 1.00 per cent nickel, 0.25 chromium and 0.25 molybdenum to a good cast iron base mixture. This has high abrasion resistance, resists grain growth and does not crack in service.

Table III

Partial Analyses of Typical Greases

	Viscosity Sec.	Viscosity Deg. Fahr.	Flash Point, Deg. Fahr.	Pour Point, Deg. Fahr.	Soap content	Graphite content, %	Penetration point unworked E. P.	Penetration point unworked	Notes
Cup greases	150-180	100	370	-16	Acc. to number	None	None		Use with cups
Grease for hand guns	225	100	385	0	Low	2 (synthetic)	?	365	High-speed and light work
Grease for pressure systems	900	100	420	-16-20	Low	None	None	250	Hot and heavy work
Roll neck greases, babbitt bearings (hand packed)	High	....	High	Medium	High	9 (mineral)	....	56	
Babbitt bearings, pressure system	800	100	410	12	Medium	7 (mineral)	....	220	
Hot neck grease for hand sheet mills	.....	....	420	12	High	10 (Bentonite)	....	...	Melt—350 deg. Fahr.
For mixing oil	250	210	650	Very high	.....	.....	....	...	
Roll neck roller bearings, open housing. Hand application, pinions	800	100	425	20	Medium	.....	Yes	230	3% sulphur, 7% lead
Asphalt product. Several densities according to speed of mill	1750-6000	100	470	.....	.....	.....	....	...	
Closed housings, asphalt base	1750-6000	100*	...	.....					
Closed housing	79	210	385	0		5 (synthetic)	?	360	
Reduction gears, mill drives and lighter	66-79	210	385-400	0	?	5 (synthetic)	?	360	
Reduction gears E. P. mill drives and lighter roller bearings	3500-5500	100	...	-6	?	7-9 lead soap	....	...	
Motors for hot and cold saws—									
Normal temperature, lime soaps	215	100	370	0	6-8	2 (synthetic)	?	365	
High room temperature soda soap	350	100	390	-20	Low	.....	....	340	
Mill general—heavy and warm locations	800	100	425	-10	?	.....	....	220	

*As base stock, cut back to 3000 seconds viscosity for heavy-duty mills—Steam refined cylinder oil from necks 145 to 210.



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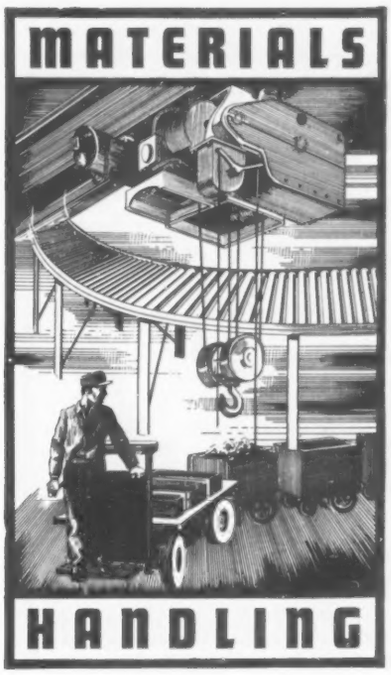


Ram Trucks

Use of ram trucks in handling coils has helped make the steel industry the best customer now for this type of equipment

J. A. CRONIN, Materials Handling Editor

■ IT IS SIGNIFICANT that the steel industry has been the best customer for electric industrial trucks during the past two years, although not many years ago it was the railroads and other transportation agencies which were frequently in this category.

Several causes have contributed to this change. One is the vigorous and extensive expansion and rehabilitation programs which have been progressing rapidly throughout the industry during 1937 and 1938. In such periods in the past, materials handling equipment has been found, by other manufacturing groups, to provide a valuable co-ordinating factor in attaining greater efficiency from productive machines. Records of various branches of the materials handling industry demonstrate that steel plant executives have recognized the advantages of this co-ordination, and that today they are sold thoroughly on the importance of combining cranes, conveyors, monorails, lift-trucks and other classes of labor aids into systems which provide a closer relationship between production and materials handling methods.

Viewpoint Changed

In the particular case of industrial trucks, rapid expansion of use may be attributed also to what W. H. Burr, chairman of the developments committee of the Association of Iron and Steel Engineers, in a recent review, called a "radically changed point of view toward truck equipment" on the part of steel operating men. As he expressed it: "Formerly trucks were looked upon as purely auxiliary equipment, but now they are considered as much a part of the steel producing machinery as the rolling equipment."

How important a place trucks occupy and how varied are the operations in which they have a major part are indicated to a marked degree in some of the handling operations in one of the large steel mills in the Middle West.

In the manufacture of strip steel in this mill, ram trucks are first used after the bar has been put through the hot strip mill, and thence through the pickler. When the strip is coiled, wired and sorted onto a conveyor, a ram truck (Fig. 1) picks up the coil and hauls it to the coil storage, Fig. 2. In some mills, these rams are used also for stacking coils, Fig. 3, especially if floor space is at a premium.

In Fig. 4 is illustrated a ram truck depositing a coil at the roller level, which is located immediately in front of the 4-high reversing mill which may be seen at the left hand side of the picture. The strip here is reduced to the required thickness by reversing the mill until the required gage is obtained.

At the discharge end of the mill, the coil is picked up again by the ram truck and hauled to a scale, where it is weighed, as shown in Fig. 5, and thence hauled to the cleaning machine, the end of which is shown in Fig. 6. This machine cleans the coil, and at its end the strip is coiled again, and either upended by an upending machine placed in the floor, or by an upending truck. The coil

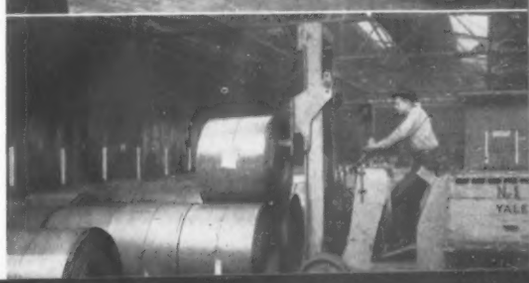


Fig. 1—(Top)—Ram truck at end of conveyor from pickler picks up coil and transports it to storage. Fig. 2—View of coil storage area in a midwestern steel mill. Ram truck is depositing coil which it has brought from pickling department. Fig. 3—In some mills, the ram trucks are used also for stacking coils, especially if floor space is at a premium. Photos courtesy Yale & Towne Mfg. Co., Philadelphia

now is placed on cars which are hauled to the annealing room. where the coils are placed in the annealing oven.

After annealing, the coils are upended to a horizontal position, either by upending machines or trucks, then picked up by ram truck and hauled to the skin-pass mill. At the discharge end of the latter, coils are picked up by the rams and hauled to flying shears, where the strip is cut into sheets. In the mill in question, these sheets, if intended for tin plate, are hauled to the picklers by special carriers. After pickling, the sheets are placed in water boshes, which are hauled to the tin machine at the end of which fork trucks pick up the tin plate and transport it to the sorting room. After the plate has been sorted and reckoned or counted, weighed and bundled, fork trucks haul it to the warehouses and thence to the freight cars or motor trucks.

Operation on other sheets, such as those for automobiles, is somewhat different. For example, the flying shears cut the strip into the required lengths, and special conveyor lift-trucks transport them to the respective succeeding operations. In most instances, a 10-ton sheet loader is used for hauling sheets to freight cars after the former have been bundled.

Fig. 2—Close-up of one end of processing table showing method of spring-mounting of conveyor rollers which absorbs shock of heavy loads of steel. Space between parallel lines permits dropping of adjustable end stop

Roller Conveyor Spring-Mounted

■ IT HAS BEEN characteristic of developments in materials handling equipment during recent years that progress has been more largely in the direction of improvements in design and in new adaptations of existing types than in the introduction of entirely new classes of machines.

Some of these changes in design have been distinctly novel and as a result have been incorporated as integral parts of many recent installations in steel and metalworking plants. One typical example is a spring-mounted, heavy-duty roller conveyor, which was announced last year and described in STEEL, April 12, 1937. Since it was first introduced, 16 companies are reported as having ordered 26 individual systems embodying this unique design.

Typical of the use of this equipment is an installation used in the processing of sheet steel. The entire system, termed a processing line, involves the combination of live roller conveyor tables placed between processing machinery. In the foreground portion of Fig. 1 of the accompanying illustrations is shown the discharge end of the system and the roller leveler through which sheet steel passes. Operations are continuous, each machine being connected by a conveyor table, having a surface speed which varies from 100 to 400 feet per minute, depending upon production and requirements.

Piling Unit Adjustable

Equipment in the foreground of Fig. 1 is known as a piling unit. It consists of a motor-operated piling bar, adjustable for position horizontally to suit the width of the sheet steel being processed. Sheets are

(*Please turn to Page* 71)

Fig. 4—(Top)—Ram truck depositing a coil at roller level which is in front of a 4-high reversing mill. Fig. 5—From discharge end of the reversing mill, the coil is transported to a scale and weighed. Fig. 6—In this illustration is a ram truck about to deposit a coil at the end of a cleaning machine

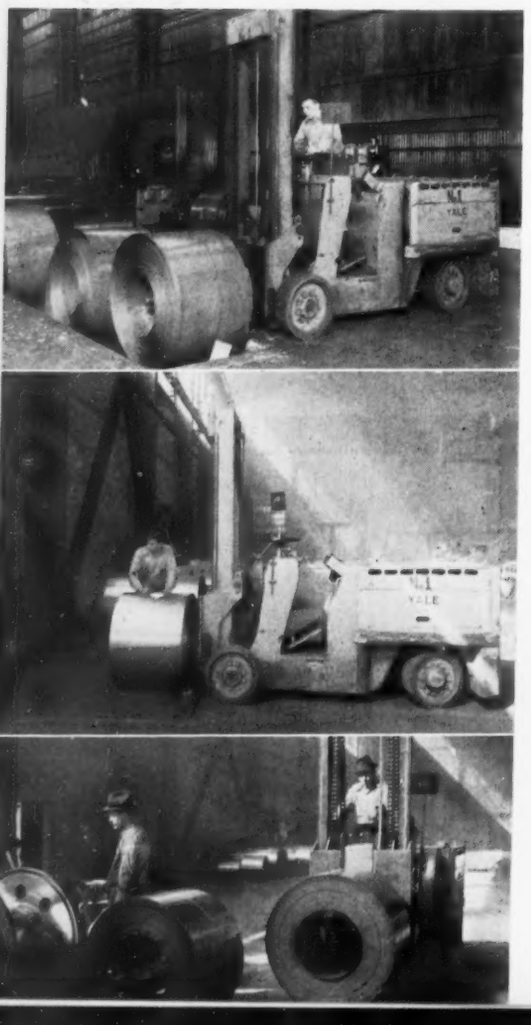
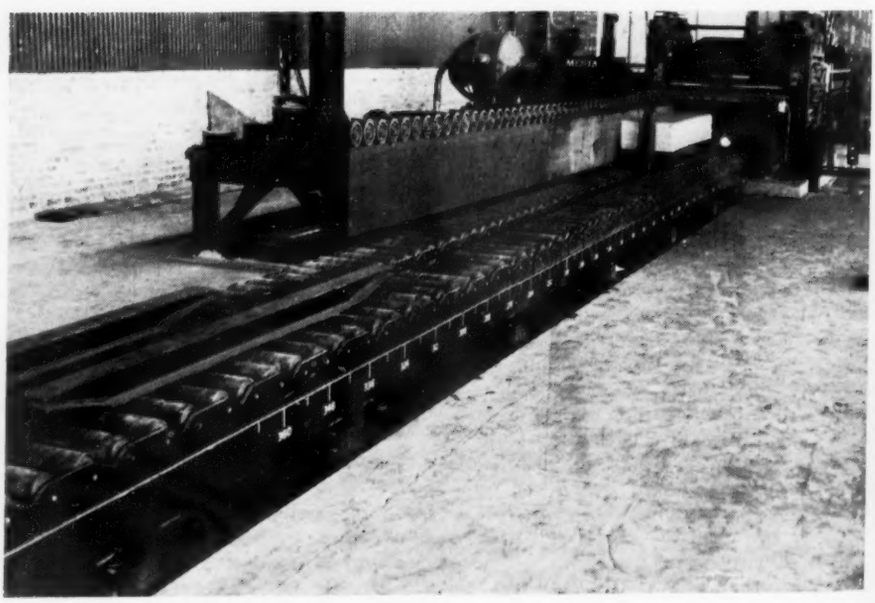


Fig. 1—Piling unit on roller conveyor table with motor-operated piling bar which may be adjusted for position horizontally to suit width of sheet steel being processed. Side guard is provided for stacking and squaring of sheets



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MOTOR DIVISION

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Wheeled Toys

(*Concluded from Page 49*)

in one operation; the object in forming is to throw up the ribs which stiffen it. Without these ribs the bottom would be too flexible and would soon sag out of shape. At *B* and *C* are shown completed sides and ends and at *D* a completed body.

In assembling the body the operator takes two sides and slips them in place on the bottom. As shown in Fig. 2, the half round, *B*, forms a slide into which the bottom can be slipped. Each of the ears, shown on the ends *B* and *C* on Fig. 4, overlaps the other section. Then by electric spot welding at various points, as shown in Fig. 5, the body is fastened together firmly so that the sides and bottom form what is practically an integral unit strong enough to resist all reasonable wear. As a matter of fact a body of this kind can be bent completely out of shape without parting or disturbing the welds in any way.

Small Wheels are Disk

Wheels for the toys range from 6 to 10 inches in diameter. The smaller wheels are of the plain disk variety but the larger ones are provided with punched holes and are called spoke wheels. In Fig. 6 are shown progressive stamping operations in making these wheels. *A* is a blanked disk, the result of one press operation; in other words, the stock is blanked and formed at one stroke of the press. The next step is shown at *B*. The center portion has been flattened and formed to make a seat for the end of the roller bearing shell and the center hole has been pierced. *C* is a blank with the holes punched to form the spokes. A finished wheel complete with its tire is shown at *D*. On the disk which forms one side of the wheel a stamping operation is necessary to throw out the six prongs which hold the hub cap in place. This cap is blanked and formed in one press operation. The two disks which form the wheel are spot welded together with the roller bearing interposed between. *F* is a roller bearing which consists of an outer shell and, in this case, eight rollers. *G* is the shell, made of a single piece of sheet steel with offset ends and curled into cylindrical form. The stock is blanked in an ordinary blanking die and then curled in a special curling die. The object of the offset is to break the joint; otherwise, if the joint were a straight line, the shell soon would wear out of shape at that point through the pressure of the rollers. The offset form of construction distributes and equalizes the pressure. These bearings are simple in construction and if oiled occasionally give good service for many years.

Stock for the axles runs from ⅜ to ½-inch in diameter and is bought in coils as it is easily shipped and handled in this manner. At the plant the stock is run through a straightening machine of the "whirler" type and cut off automatically to the desired lengths.

Aside from the welding operations previous described very little assembly is necessary except for a few minor operations such as putting tires on wheels. The great bulk of these toys is shipped in knockdown condition and assembled by the dealers.

Wheels Degreased

After bodies and wheels are welded they are degreased, spray painted with a special toy enamel and the enamel baked. A chain conveyor carries the parts through the ovens several times. The trade mark is stenciled with a special die and white enamel. Popular colors for these toys are red for bodies, green blue or aluminum for wheels, and black for bolsters, handles and braces.

The opinion held by many that toys of this type are made as cheaply as possible by unskilled help is a fallacy. This branch of the toy business calls for extensive plant layout with a large investment in special dies. All of these must be changed when new models are brought out. For example, when the so-called streamline wheeled toys made their appearance a few years ago the general adoption of these models by leading toy manufacturers meant a substantial investment for new equipment.

Experts Discuss Industrial Gas

■ MEETING in Pittsburgh's Hotel William Penn last Monday and Tuesday, March 7-8, more than 150 members of the industrial gas section, American Gas association, listened while some fifteen experts discussed gas sales problems in the various fields where gas heat is used.

Emphasis in most cases was on the sales problem under current lax business conditions. The first session, under the chairmanship of Hale A. Clark, Detroit City Gas Co., Detroit, and chairman, Industrial Gas section, was led off by Charles E. Bennett, president, Manufacturers Light & Heat Co., Pittsburgh, who stressed the importance of load factor in economical selling and operation. Proper load selection is the keynote of higher profits and as such should be a major factor in a sales campaign, according to Mr. Bennett.

Nonferrous foundry melting with gas has made rapid strides since the first successful crucible was designed in 1935, according to a report given by Ralph D. Hawkins, Bridgeport Gas Light Co., Bridgeport, Conn., and chairman of the nonferrous metals committee. Improvements have been due largely to proper application of high temperature refractories which have recently become available. Other contributing factors have been lower gas rates and improvement in furnace design. Oliver D. Pritchard, Brooklyn Union Gas Co., Brooklyn, N. Y., who designed the first of the modern gas-fired crucible melters, collaborated with Mr. Hawkins on the report.

Melting Described

Developments in immersion melting of soft metals were described by Elmer B. Dunkak, general manager, C. M. Kemp Mfg. Co., Baltimore. Fields now covered by this comparatively recent idea in metal melting include type metal melters for publishing houses; heating of tin pots incident to the manufacture of sheet, tin and terne plate and dipping tableware and other small stampings in the ferrous industries; a wide variety of applications in the nonferrous field including melting of lead-antimony alloys for the production of storage battery grids and terminals, tin and lead coating of copper wire, and for heating large tinning baths used for the dipping of automobile radiators and extended radiation for air conditioning; various applications in the process industries such as the melting of mold metal in connection with the manufacture of molded plastics and hard rubber. Installations have demonstrated practicability, according to Mr. Dunkak, in pots ranging in size from 30 to 525,000 pounds. Advantages of this method of melting include reduced fuel consumption, more positive control of temperature, reduction in dross formation, improved working conditions and longer pot life. As an example of cost reduction, the speaker cited the experiences of an installation in a tin mill where the B.t.u. consumption per base box was reduced 54 per cent. This saving amounted to only 10 per cent of the total saving, however the balance being made up in savings on other components, chief of which was virgin tin.

Up-to-date gas firing in forging practices of one of the world's largest automobile makers was described by M. W. Martin, Public Service Co. of Indiana, Indianapolis. In this plant forging operations are largely devoted to front axles and smaller forged parts such as steering

(*Please turn to Page 72*)

GALVANNEALED
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SHEETS
Not merely Lids--
but "TOPS"
Youngstown Galvannealed Sheets are "tops" for the most difficult forming and drawing in your press room. The patented fusing process bonds the zinc coating to the base metal, yet both are equally ductile, and severe bends without flaking are perfectly safe. Shown here are washing machine lids. The small illustration shows a curved and rolled edge holding a rubber gasket in place. Note the unretouched photo. It shows how well and how tightly the Galvannealed finish has held to the base even under this severe treatment. There'll be no trouble here from flaking paint or enamel.
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9-3A

By ROBERT E. KINKEAD

On this page the author, well-known consulting engineer in welding is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

Incentive Needed In Welding Research

■ The fact that welding research laboratories have been operated for ten years without producing an important invention offers some justification for inquiry into the reasons for this state of affairs, particularly at the present moment when the country as a whole is being held back for lack of new inventions as a means for the employment of men and profitable employment of capital.

The fact that the welding industry does move forward is the result of inventions which come from sources other than the research department. Examples are omitted for the reason that a solution is needed rather than to cast reflections on the efforts of competent and industrious laboratory workers.

The beginnings of the matter occur in the technical school where all individuals are indoctrinated with ideas suitable for researchers in abstract science. Such individuals are loaded up with the idea that they may never expect to earn much money and must look forward to getting their life's satisfactions from honors. After the honeymoon period of the initial five years in an industrial research laboratory the man finds out that the idea is actually practiced but that the honors are of doubtful value for other employment and wholly non-negotiable for groceries, automobiles or college education for the kids. The idea of group inventions successfully prevents the man from taking too much credit to himself no matter how brilliant his ideas may be. Result, few inventions.

To correct this condition requires application of the most fundamental principle of the capitalistic system —apply an incentive. Academic ideas have been tried and found wanting. The professors have concocted a system which they thought would please the capitalists because they would get all the gravy. What has happened is that the system has dried up the source of the gravy in the research departments —the desire of the individual to get ahead in the world. There is unlimited power to produce inventions in the research laboratories of the country if business men will cast out the academic ideas from these departments and pay cash for good inventions.

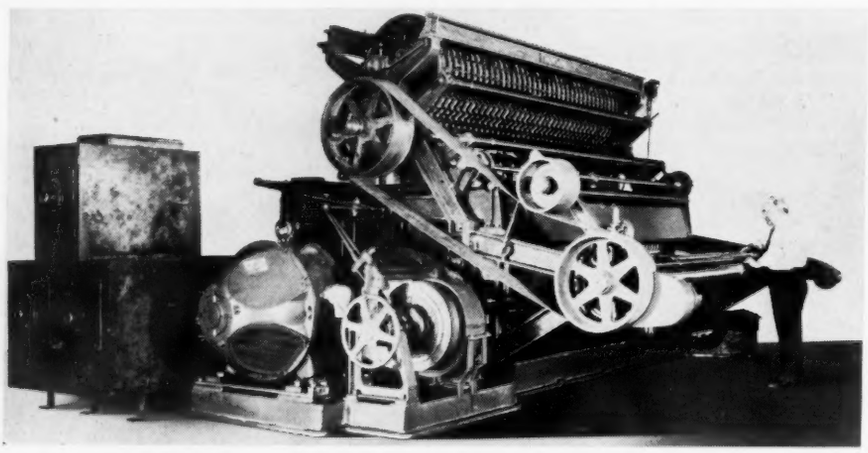
Bolted Construction vs. Continuous Structures

■ Mechanical designers who work in welded steel construction will be interested in an article entitled, "Steel Castings Replaced Built-Up Constructions" by William M. Sheehan in the February *Metal Progress*. Engine beds, tender frames and other large one-piece castings for steam railroads are used to illustrate the advantages of continuous metal structures as contrasted with built-up bolted construction. Longer life and greater reliability in service are shown for the continuous metal structures. A considerable amount of expensive machine work is eliminated by one-piece construction.

Precisely the same mechanical and service advantages are obtained by the continuous metal structures used on the modern equipment for railroads where the necessity for weight reduction throws the construction into light weight materials which may be most economically welded. Thus, the diesel engine locomotives almost all have welded steel frames and this type of construction is used on truck sides and car bodies. Welded construction is not competitive with steel castings for the reason that in many cases castings could not be used on account of excessive weight. In the large steam engine beds welding cannot be economically used on account of the heavy sections involved.

The important principle involved is not castings versus welded construction but continuous one-piece metal structures versus assemblies held together by mechanical fastenings such as rivets and bolts. Application of that principle brings about radical changes in production methods and, in many cases, important cost reductions. A fair estimate of the cost of obtaining all of the economies possible by universal application of this principle for the country as a whole would be 5 billion dollars worth of new and larger machines and 500 million dollars worth of the products made by the welding industry. Everything from ocean vessels to flying machines can be made by this method.

Production by the Mile



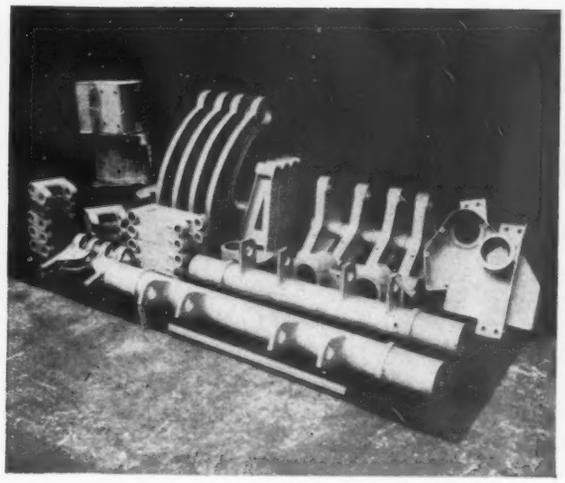
■ **Delivery end of Thomson wire fabric welder with 25 horsepower motor drive, wind-up reel and three auto transformers which regulate 37 welding transformers. Maximum capacity is 200,000 square feet or around 80 tons of fabric per day. Automatically makes wire netting using any size steel wire from 14-gage to ⅜-inch. This welder is a product of Thomson-Gibb Electric Welding Co., Lynn, Mass.**

HOW TO CUT COSTS AND IMPROVE YOUR WELDING

ricators of welded products of ry description are getting their ts down to rock bottom with rex Electrodes.

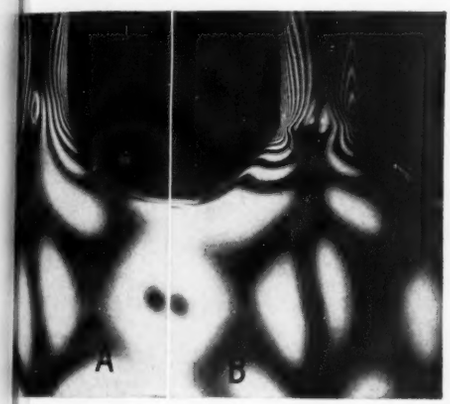
ou can make similar savings d, at the same time, be assured of -notch welding by using Murex. k into the advantages of these vy coated rods. Write for the rex Booklet. Ask to have a Murex lding expert look over your lding operations.

Murex representative in your territory is exnced, not only in welding procedure, but in shop practise and production methods. im to work on your problems.

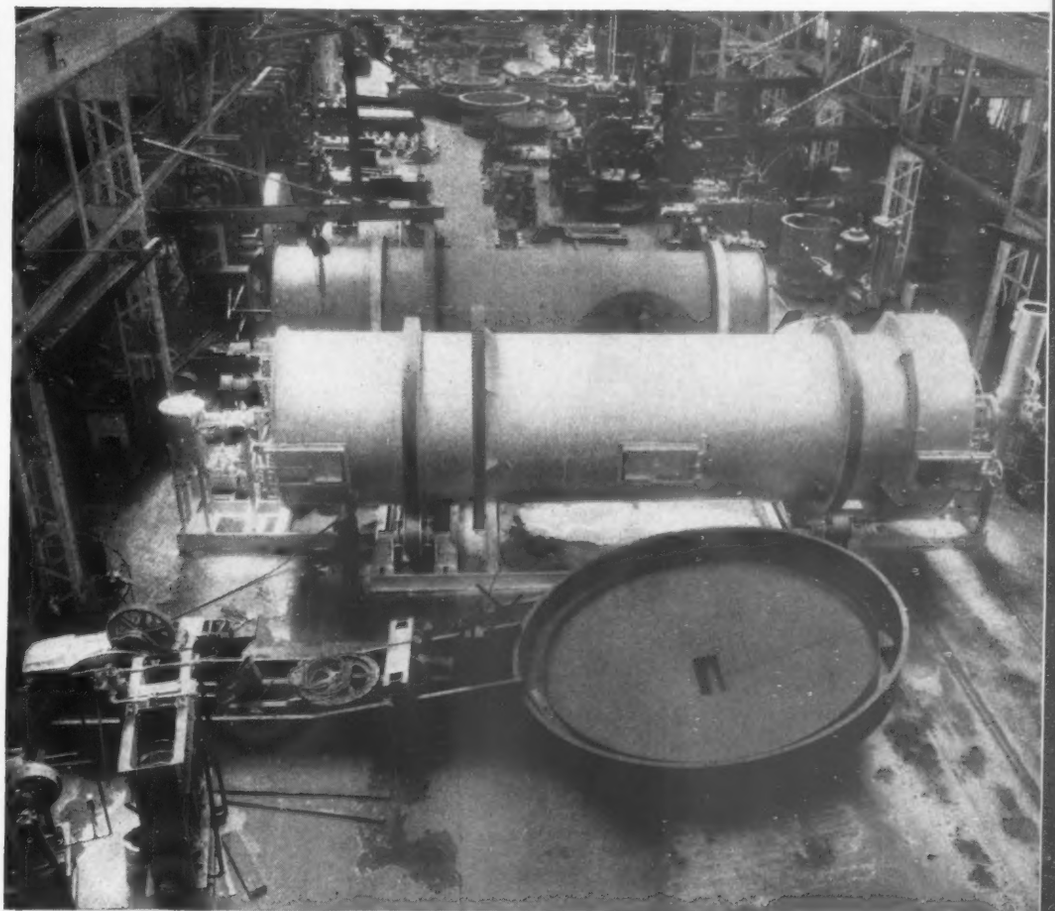


1 Smooth, spatter-free Murex welding cuts cleaning time and assures extra savings where fabricated small parts replace castings.

2 Two time-saving features speed work in tight quarters where Murex is used: (1.) Electrodes can be bent, (2.) There's little smoke; no fumes.



Compare stress concentrations in Pictures A and B. Assuring well-rounded, concave fillets those in A is just one way that Murex provides er welding.



Welders find it easy to qualify for Class 1 ork with Murex. "All our operators passed flying colors on the first attempt," reports ompany.

5 In production work and the fabrication of equipment such as these crystallizers, the higher heats at which Murex is used make remarkable savings. "Heavy fillets are made in 24% less time," says one manufacturer. Another finds Murex "37.5% faster in flat welding."

MUREX HEAVY COATED ELECTRODES

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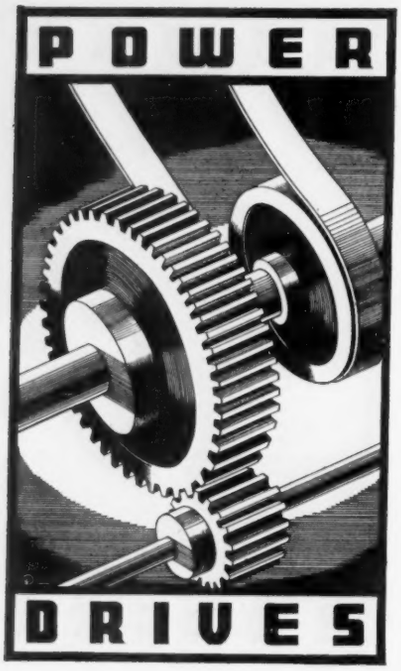


Power Correction

Many losses may be overcome and the extra capacity utilized in feeder and distribution lines by rearranging the loading or finding most suitable type of motor for the work

■ LOW POWER FACTOR is becoming an increasingly important problem in industrial plants, irrespective of whether power is purchased or generated within the plant. Losses and extra capacity in feeder and distribution lines resulting from low power factor are a penalty on any plant. In addition, public utilities are either applying low power factor penalties more strictly or, if no penalties are exacted, are insisting on improvement or correction of the worst offenders. In most cases a bonus is offered for high power factor, which makes correction profitable.

Rearranging Loading

In general power factor may be raised by: Rearranging loading on induction motors so that they operate at more nearly full load, sometimes to a point at or above the minimum required by the public utility. In very few cases does this improvement permit earning a bonus, and as it cannot be applied to all motors, seldom permits reaching the no-penalty point. Incidentally, underloaded induction motors are the most common cause of low power factor. Therefore, any improvements in loading of such motors should be the first step in correction. Any increase in power factor obtained in this manner decreases the amount and cost of other corrective equipment which may be necessary to avoid penalty or to earn a bonus. Where special corrective equipment is applied, sufficient capacity to earn a bonus permits a profit on the investment.

Individual motors on machines with a highly fluctuating power consumption, varying from practically no load to short peaks of full load or higher, but with an average load of 30 to 60 per cent of full load rating are responsible for much of the low power factor in plants. This can be improved by grouping such machines so that a single motor drives several units thus giving an average load of 60 to 80 per cent of normal full load rating.

Load Study Advised

A careful study of the loading on each motor, preferably by graphic meters, through several complete cycles of operation is the best method of obtaining the actual motor load and its relation to full load rating. With data on several motors the plant engineer can then plan for rearrangement of equipment to improve loading and power factor.

In synchronous motors, or wherever one or two large motors operate continuously at approximately full load, as on air compressors, plating generators, and other similar continuous duties which are suitable for the application of synchronous motors, the substitution of such motors for induction motors often permits raising power factor to 95 per cent or better.

Static condensers or capacitors for power factor correction are becoming widely applied. Such equipment is fairly low in cost, compared to other methods. It is easily installed and operates with practically no maintenance expense. Another advantage is that such equipment may be mounted on walls or ceilings out of the way where floor space is at a premium.

Correcting as much as possible of the power factor through improved loading of induction motors reduces the amount and cost of extra corrective equipment necessary for correction. Usually when this is done the bonus earned, plus the elimination of penalties, will pay for the extra corrective equipment in approximately 1 to 3 years, thus making it an exceedingly profitable investment.

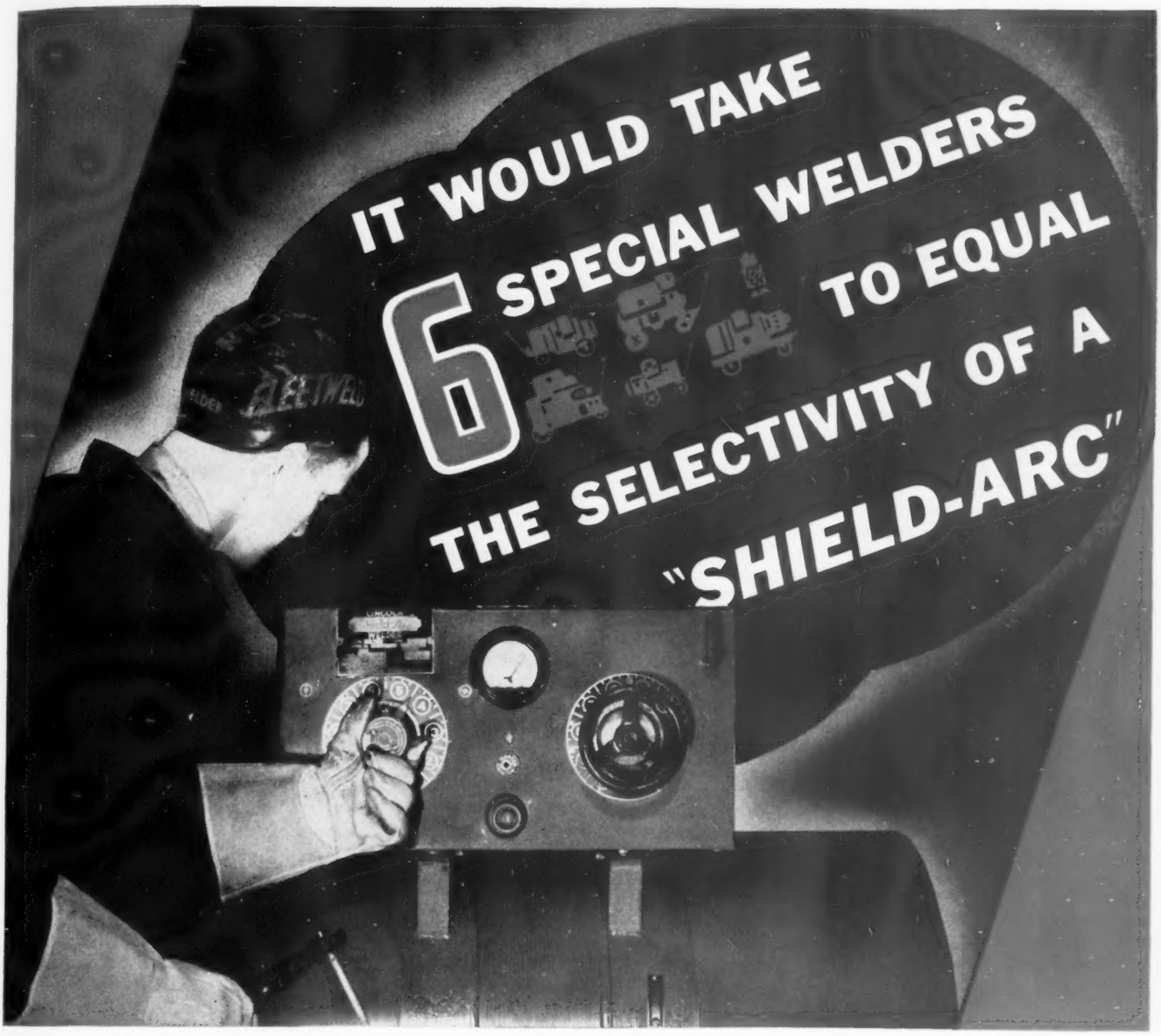
The effect of underloaded induction motors on individual drives and on similar machines driven in a single group is well shown in tests made in one plant. Seven old machines were driven in a group by a single 20-horsepower motor. Because they operated with a high load factor, the power factor of the single motor was about 80 per cent.

In this same plant two new machines of the latest type with antifriction bearings are each driven by a 2-horsepower motor. This makes a saving in power required as each of the old machines required about 3 horsepower. However, the power factor on the motors operating the new units is only about 40 per cent.

Power Factor Low

If all the machines were similarly individually driven the combined power factor would be very low. In such cases individual drive on a few machines is highly desirable to handle special orders and fluctuating production requirements. Unless motors of lower horsepower rating be used, which is not always possible because of starting requirements, the low power factor must be corrected in some other way.

Plants generating their own power also find a saving in power factor correction. Particularly is this true when the generating system is operating at practically full capacity. By eliminating the reactive loss which causes low power factor by any of these methods of correction,



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the useful load capacity is actually increased by the amount of the loss corrected. Similarly the power load distributed is also reduced so that sometimes feeder lines which have been overheating and ordinarily would necessitate new or auxiliary circuits can be continued in service without renewal or replacement. Frequently additional equipment may be added where under former conditions a distribution line had been overloaded.

These are considered as secondary advantages to the bonus and elimination of penalties which are actual monthly savings in power expense. Nevertheless many plants which generate their own power are not taking advantage of such opportunities to save because they do not see the costs itemized on the monthly power bill. The savings may be made, however, and result is an operating profit instead of a loss.

New Principle in Design of Motor

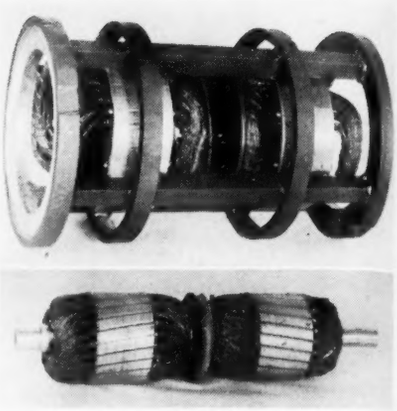
■ EMBODYING what is said to be an entirely new principle in motor design, Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., is offering a 3-phase, alternating-current motor having speeds continuously variable from zero to maximum. This fully continuous speed regulation is obtained without rheostat losses, and motor speed is practically independent of the load as speed-load characteristics are similar to a shunt motor.

Torque is constant throughout the entire speed range. Simple in construction and operation, the new motor includes across-the-line starting and remote control of speed regulation where required. It is said to have a wide field of application on such jobs as driving textile spinning frames, printing presses and all types of machine tools as well as in power stations, steel mills and similar places where its ease of speed control and stable operating speed will result in increased efficiency and higher production.

Direction Can Be Changed

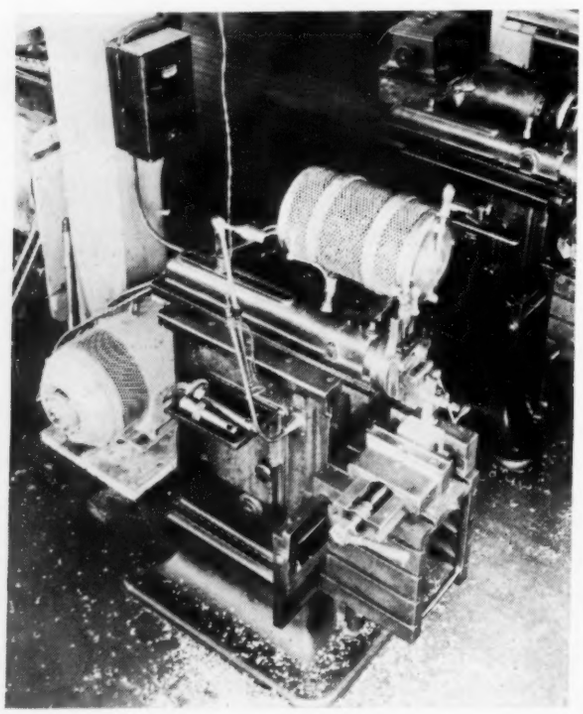
Power factor is about the same as that of an ordinary induction motor at the higher speeds. Direction of rotation can be changed by reversing any two line leads. In starting directly across the line, speed regulator should be set at minimum for the larger sizes but small sizes can be started and will come up to speed with regulator in any position. Full load starting torque can be developed with little more than full load current. Starting torques up to 400 per cent are available, only that torque actually required being developed with a corresponding saving in current drawn from the line.

This unusual combination of motor characteristics is obtained without complicated equipment, a simple speed regulator being the only auxiliary apparatus involved in addition to usual start-stop control. Motor has a commutator and three sets of brushes through which a variable, three-phase, alternating current voltage is applied to the rotor windings which are similar to a normal direct-current armature winding. Stator winding is similar to that used in three-phase induction motors.



These are the elements of the speed regulator used with the Crocker-Wheeler polyspeed motor. Two single-phase voltage regulators are combined in one frame with rotors on a common shaft

The speed regulator consists of two, single-phase, induction type, voltage regulators placed in one frame with the two rotors mounted on a common shaft. This unit provides the adjustable 3-phase voltage which is applied to the motor brushes.



Wide range of speeds available with new alternating-current motor is especially useful on machine tool drives. Exact speed for maximum production is easily obtained

♦

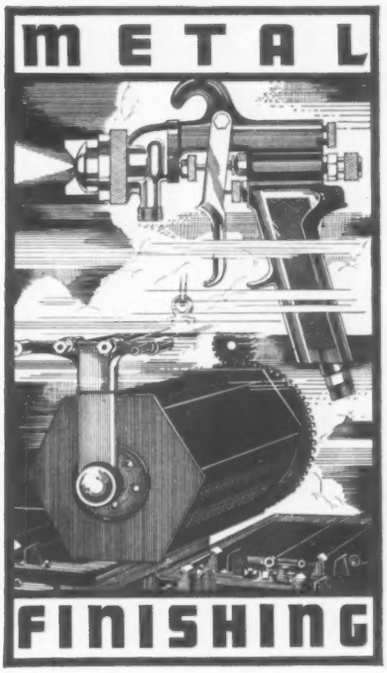
According to a prominent power transmission engineer, from 25 to 35 per cent of industrial equipment does not permit combining efficiently and so must be eliminated from group drives. The remaining 65 to 75 per cent of machines may be driven either individually or in groups according to the limitations of the particular production cycles and layout or arrangement requirements.

♦

Inspection and servicing of electrical equipment is most satisfactory if carried out on a definite schedule. In one plant an electrician is assigned to inspect and oil all motors twice a month, all elevators weekly, speed reducers once a month, and antifriction bearings in various definite locations twice a month. Each inspection is recorded on a card as performed. These cards are issued to him regularly but he plans his own routing.

♦

Before going to the expense of changing to something else be sure that what is in use is installed, maintained and serviced properly. Many times changes are made where the only advantage is that the new supplier impresses the necessity of proper installation and treatment upon the purchaser.



New Bath Blanket

Research finds a way to stop enormous oxide losses in galvanizing operations. Important decrease in radiation losses also accompanies use of new material

By W. H. SPOWERS JR.
Consulting Engineer
New York

■ IN GALVANIZING operations, there are two very serious losses, the accumulation of oxides on molten zinc and the heat radiation losses which occur almost entirely from the surface of the metal.

When exposed to the air, oxides readily form on the surface of all molten metals. These oxides may be skimmed off but almost immediately re-form and continue to grow. This may occur very rapidly in some cases but, in any event, it occurs steadily and continuously as long as the metal remains molten.

Zinc oxide thus formed contains approximately 70 per cent zinc which comes, of course, from the fluid zinc costing the price of prime western metal. Sale of this oxide recovers only a very small percentage of the actual cost of the zinc content, due primarily to the difficulty of converting zinc oxide into a useful product.

Loss Is Expensive

Pipe galvanizing, wire galvanizing and many other types of galvanizing stagger under losses of thousands of dollars due principally to this oxidation loss. Taking a standard straight wire kettle where the wire enters the galvanizing kettle at one end and leaves from the other, the zinc surface at the wire entrance point usually is protected from oxidization by the volatile flux covers. This is being formed continuously by the action of the No. 20 flux wash, but the remainder of the zinc surface is left open to accumulate oxides from one drossing to another. That this oxide loss is serious will be seen from the statistics taken from one standard straight wire installation.

With an exposed surface of approximately 65 square feet, this installation accumulated 102,792 pounds of zinc oxides during one year's operation. This accumulation of zinc oxide contained about 70 per cent zinc which, at the market price, represented a loss of approximately $5000 in one year. This loss totaled nearly 10 per cent of the new zinc used. With over 41,000 net tons of zinc used annually in the wire field, the enormity of this loss throughout the country is at once apparent and this is only in the straight wire field.

Now consider a standard pipe installation where the pipe or tube kettle is divided lengthwise by a dam, pipe being fed into the kettle sidewise. A blanket of volatile flux covers the entrance side of the dam to wet the flux-washed pipe. It also effectively prevents oxidization on this portion of the kettle. But the half of the kettle surface on the other side of the dam is left open and free to accumulate oxides.

On the pipe kettle under consideration the area of this side was approximately 36 square feet yet 1,443,552 pounds of zinc oxide were produced on this relatively small surface in one year, representing a gross loss of over 25 per cent of the new zinc used. With over 54,000 net tons of new zinc used annually in this country for galvanizing pipe,

Steel And Glass Block In All-Metal House

■ **One of a group of all-metal houses built by Hobart Brothers, Troy, O. Armco galvanized Paintgrip was used for gutters and downspouts to permit immediate painting; 16-gage sheets form exterior walls**

it at once becomes apparent that here is another enormous loss.

And these are only two examples covering only two types of galvanizing out of a total of approximately 2400 galvanizing installations in this country which are permitted to stand at night times, over shut down periods and weekends steadily accumulating this costly residuum.

Rests on Surface

To eliminate formation of oxide and to control heat radiated, a material had to be developed that would rest on the surface of molten zinc (maintained between 820 and 900 degrees Fahr.) and not burn, char, flash, melt or cake. Preferably it should form, upon contact with the zinc, a layer of inert gas.

Before such a material was found the number of different substances studied and combinations of materials which were tested yielded a laboratory number for the finally accepted product of G. B. 412.

This material, when placed on the surface of the zinc remains in its original form and is granular in appearance. It will not burn, char, flash, melt or cake and is easily applied and removed. When placed upon the surface of the zinc, this granular material forms a blanket of inert gas over the entire surface of the zinc thus covered and keeps air away from the zinc. Thus no zinc oxide can be formed. Known as G. B. 412 galvanizers' blanket, this material is manufactured by Gray Chemical Co., Roulette, Pa.

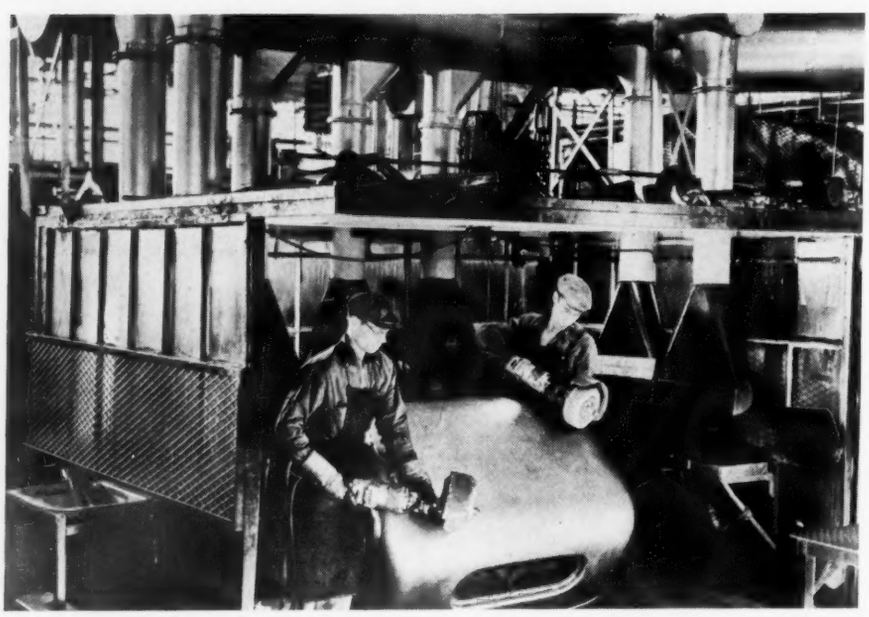
Its insulating properties are so effective that savings in heat lost through radiation have been reported between 35 and 50 per cent, depending upon the depth or thickness of the blanket used. So effective is this material in blanketing the heat within the kettle that it is necessary to warn operators to watch carefully the temperature of the bath at the time of the first application to prevent development of excessive temperature. In some instances even the pilot burners have been found to supply too much heat.

The technique of application suggested in the use of this material is simple but should be accurately followed. Using a skimming tool, start at one end of the kettle and skim the surface free from oxides. Immediately following the skimming tool and before any oxidation takes place, spread the blanketing material on the surface of the zinc to the desired depth. Application thus follows the skimming tool over the entire surface to be covered.

New Rust Solvent

■ Nielco Products Co., Detroit, has a new liquid rust solvent claimed to remove rust and to produce a bright surface. It can be applied to metal surfaces by a brush or spray gun or small parts can be dipped into a tank of the solvent.

Three-Sided Polishing Booth Has Unusual Features



■ **Pressed steel tops for Chevrolet truck cabs are polished in this special 3-sided booth in which air is completely changed every few seconds by seven exhaust ventilators, minimizing dust hazards for the operators. In addition, water is sprayed down the glass sides of the booth continuously to collect stray dust**

Application of Tin on Steel Aided by New Flux

■ Ever since the discovery that a coating of tin on the surface of steel or cast iron served as a decorative and reasonably permanent protection against rust, it has been common practice to use some substance as a flux and also as a top covering for the tinning bath. Flux materials have been and still are available in many forms. Dry salts as well as solutions of various concentrations are widely used. However, the action is substantially the same regardless of the form or method of application.

One of the newer materials is Blitzstone, a flux recently developed by the American Solder & Flux Co., Philadelphia. This product is available in liquid form, the solution having a gravity of approximately 50 degrees Baume. It may be used as a dipping flux and also as a top cover for the surface of the tin bath. It is finding use both in tin plate mills and in the tinning of castings. Blitzstone is said to possess high activity, long life and to be dependable in action and to result in a bright, smooth and uniformly tinned surface. In many cases it has eliminated the re-dipping operation.

Sprayed Tin Cuts Retinning Costs

■ Application of tin coatings by spraying has expanded in recent years, following the development of efficient apparatus for this purpose. The process is used primarily for retinning and is especially adapted for applying new coatings where only local failures have occurred and on large pieces of equipment where it would be expensive to remove and dismantle for hot tinning.

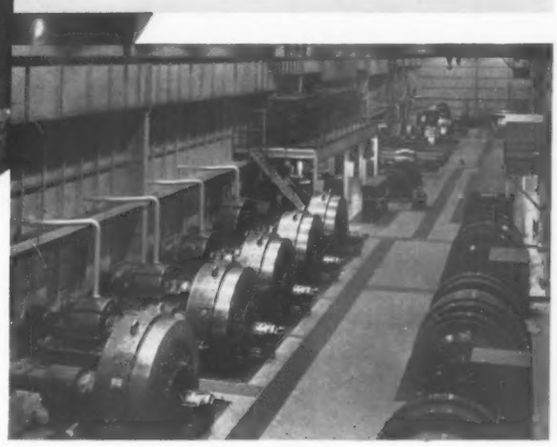
In the usual method of spraying, a tin wire is fed automatically through an oxyacetylene flame, instantly melting the tin. A stream of compressed air strikes and shatters the molten tin and carries the resultant fine particles at great speed. As the particles strike the surface they flatten as though semi-molten and key themselves firmly into the base material which has previously been prepared by sandblasting.

Polymerization Gives Name to New Finish

■ Ault & Wiborg Corp., New York, recently introduced a new finish called Polymerin. It derives its

Two Quality Lubricants... GULFCROWN OIL and GULF HARMONY OIL

SELECTED BY J & L FOR IMPORTANT REQUIREMENTS IN NEW STRIP MILL



The 28" x 55" 2-high temper mill in the Blue Annealed Building shown above is equipped with bearings of modern design. An oil of highest quality, Gulf Crown Oil "D," is being used in the circulating lubricating system to protect these bearings and to help maintain accurate gauges. At the right is shown the motor room for the hot mill. All hot mill drive motors and motor generator sets are lubricated with Gulf Harmony Oil "C," by circulating system.

BEFORE Jones and Laughlin's new mill at the Pittsburgh works went into production, the management determined to protect their large investment in costly equipment with the best lubrication obtainable.

For exacting requirements in the mill, motor room and power house, Gulf quality brands were placed in service. The Gulf engineer cooperated with the mill management in the proper selection and application of lubricants which insure dependable service from plant equipment.

Leading mills throughout the steel and metal working industries are taking full advantage of the engineering service extended to all users of Gulf quality lubricants. They have found that this careful attention to lubrication pays a generous reward in freedom from operating difficulties and repair expense.

Gulf Oil Corporation • Gulf Refining Company

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GULF INDUSTRIAL LUBRICATION

A COMPLETE LINE OF 553 QUALITY OILS AND GREASES FOR INDUSTRY

name from polymerization, the chemical reaction by which the new finish dries. It sprays freely or can be used as a dip.

After application, it gives a heat treatment which does not require special equipment. At the critical temperature, polymerization occurs. The surface attains a glasslike hardness, becomes insoluble in the commonly known organic solvents and is resistant to the attack of common acids, alkalis, chloroform, iodine, grease, oil, alcohol or other reagents, it is said.

Oven temperature and mass of metal determine the processing time, which varies from a few minutes to a few seconds, thus cutting baking time from hours to minutes or seconds and permitting high speed schedules.

The resulting surface has many valuable characteristics, it is claimed, as the hard film withstands jarring, hammering, scuffing and much other abuse. It protects metal surfaces with only one coating and in many cases requires no primary coat. The finish is flexible and has no tendency to chip. Good adhesion and flexibility enable it to withstand denting, bending and similar deformation. The glasslike surface is said to be highly resistant to abrasion, marring and "printing" from packing. Any degree of gloss or dull finish can be secured. Colors are clean and bright and whites will not discolor or darken in sunlight. Blemishes incurred on the assembly line can be touched up with the same material and polymerized by local application of heat.

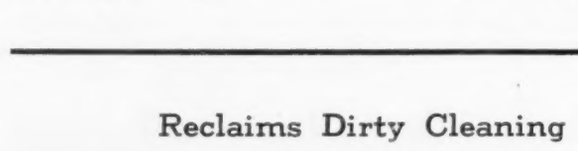
The new finish is recommended for such items as electrical appliances, medicine and utility cabinets, hospital equipment, stoves and furnaces, machinery of many types, cosmetic accessories, toys and other products.

New Slushing Compound Promises Advantages

■ Of special interest to manufacturers of sheet or strip steel is a new slushing compound applied by dip, brush or spray said to maintain a neat, clean surface on all metal surfaces during manufacturing, in storage or in transit. The material creeps over the surface to fill and seal pores and to stop oxidation and yet does not run while setting up.

In addition, the material does not rub off, is not slippery, takes enamel, paint or lacquer finishes and does not interfere with welding or stamping. Known as Poresele, it is distributed by Speroil & Paint Co., 957 Parkway, Cleveland.

Reclaims Dirty Cleaning Solvents



■ Purification of dirty cleaning and degreasing solvents at a cost of one or two cents per gallon is claimed for this recovery still, manufactured by Barnstead Still & Sterilizer Co., Forest Hills, Mass. Among the many solvents being recovered by this process are carbon tetrachloride, trichlorethylene, ethyl acetate, ether, alcohol, pentachlorethylene, acetone, toluol, benzol, naphthas and others

Plating Operations Are Projected on Screen

■ At a recent meeting of the American section of the Society of Chemical Industry, held in New York, the guest speaker, William M. Phillips, submitted a "Graphic Presentation of Electroplating Operations."

Object of the presentation was to show the mechanics of electroplating. Small glass tanks containing plating solutions, in which were suspended anodes and cathodes, were placed in a projectoscope and a magnified image thrown on a silver screen. With direct current applied to anode and cathode, the solution of the anodes was visible, as was the formation of metal on the cathodes. Depletion of metal in the solution at the cathode showed quite clearly. The amount of gas evolution showed the relative efficiency of the respective plating baths through behavior on the anode and cathode.

Elimination of pitting of nickel deposits by reduction of surface tension and by addition of suitable wetting agents was shown. Chromium was deposited on metal foil and showed the effects of inter-crystal tension by bending the foil.

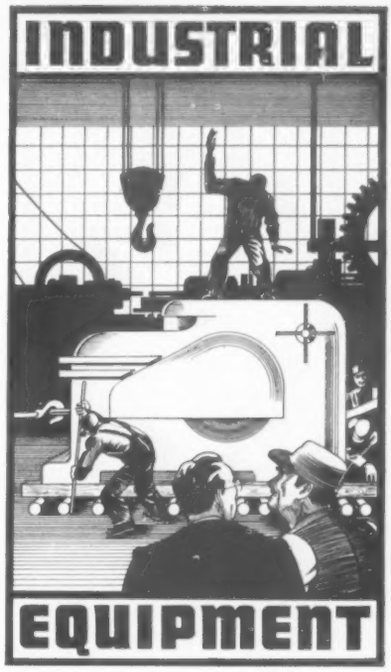
Finish Perfected for Metal Office Equipment

■ Sherwin Williams Co., Cleveland, has introduced a new specialty finish for office furniture and business machines, etc., known as S-W Satin-Glo. It is offered in two spraying and two dipping qualities and is said to produce a finish of pronounced beauty, lustre and marresistance in one coat. It also is resistant to severe abrasion, perspiration, chemicals and cleaning soaps.

Satin-Glo is built around a chemically evolved vehicle to produce a tough finish when baked. It is offered in olive green and other colors where quantity requirements justify special runs.

New Clear Lacquer Resists Perspiration

■ A new type of clear lacquer resistant to perspiration has been developed by Maas & Waldstein Co., Newark, N. J. This lacquer is applied by dipping or spraying and air-dries out of dust rapidly. After hardening for a few days, it becomes practically insoluble and resistant to moisture, soap and water as well as perspiration, it is claimed. It is useful for finishing products which are constantly held in the hand such as flashlights. It may be supplied in grades suitable for use on steel products and also for finishing copper, brass and aluminum.



Light Weight Holder Has 250 Ampere Capacity

■ Lincoln Electric Co., Cleveland, has placed on the market a type ST arc welding, electrode holder which weighs 14 ounces and has a current capacity of 250 amperes.

To assure permanence of connections, all contacts are electrically welded. Connection to cable is provided by a special, easily operated clamp which locks the electrode holder. The clamp can be tightened or loosened without tools by inserting a welding electrode through the hole in the square head of the clamp cap screw and applying leverage. When tightened this clamp maintains positive contact with the flat-braided, flexible copper strip which carries the current to the jaws. This results in a complete copper, low-resistant circuit direct from the welding machine through the holder to the electrode.

Through the use of a special clamp, Lincoln Electric light weight, electrode holder makes connections with the cable without the use of any tools

Other features of the holder include reduced width, rounded rather than square corners, heavier copper jaws which are grooved for vertical, overhead and flat welding and a hollow fiber handle. The holder will accommodate any size electrode up to and including the ¼-inch size.

Jog Eliminated Between Segments

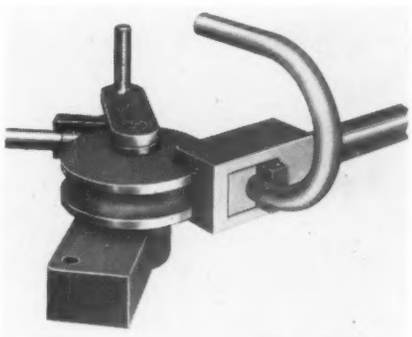
■ Continental Machine Specialties Inc., 1301 Washington avenue, Minneapolis, has introduced an improved file band saw on which the jog between the segments has been eliminated.

File is made up of short file segments mounted on a flexible steel band as before, but the ends of the segments are shaped to interlock with each other in such a way that the cutting surface flows past the work smoothly. This smoothness is accomplished with a locking miter principle on the order of a helical gear tooth construction. Under this principle the file segment, subject to pressure at any given moment, is automatically locking and lining up the next segment. The former tendency of the file segment having the pressure at the point of work to put the oncoming file segment out of line has been eliminated. Instead, the interlocking device locks each segment in line rather than forcing it out of line.

Bending Machine Is Hand-Operated

■ Wallace Supplies Mfg. Co., 1310 Diversey Parkway, Chicago, has introduced a No. 14, hand-operated, tube bending machine which is designed for bending of smaller sized tubing.

Machine will make either right or left hand bends, making a change-over without the use of any tools. It is built up of steel plates and sections and electrically arc welded. This rigid construction provides enough support under the maximum load to insure a smooth bending operation with uniform pressure. Clearance also is provided to permit complicated bends to clear easily over and under the extended portion of the machine. The standard mandrel equipment supplied with the stand will produce bends to a radius equal to 3 by the outside diameter of the tubing.



Here a 1-inch outside diameter, 14-gage steel tube is being bent on a 5-inch radius in a Wallace tube bending machine without mandrel and with a special tool set-up

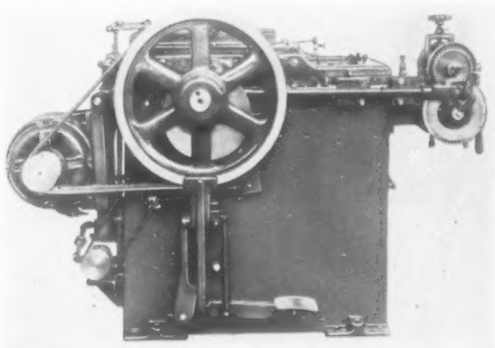
Standard machines without mandrel equipment will produce bends on 16 and 18-gage tubes to a radius equal to five times the outside diameter of the tubing. Tubing of 14-gage and heavier can be bent to a minimum radius of 3 times the outside diameter with slight flattening.

Forges Steel Balls From Cold Wire Stock

■ E. J. Manville Machine Co., Waterbury, Conn., has introduced a machine known as a ball header which forges steel balls for bearings from cold wire stock.

Balls shaped by this header require approximately 50 per cent less grinding than is now necessary, it is claimed. This is due to the perfection of a magazine quill cut-off which permits a right angle cut, thereby keeping the finished blank within close tolerances.

In producing ⅛-inch balls, a pro-



Due to the perfection of a magazine quill cut-off which makes a right angle cut, steel balls shaped by this Manville header require about 65 per cent less grinding than is now necessary

duction speed of 350 a minute can be attained. The unit is capable of producing 5/16-inch balls at a correspondingly high speed. Operation is completed in one single blow. Other features include balanced crankshaft, forced feed lubrication and an option of line shaft drive or direct motorization. Solid type dies are also used.

Sandblast Static Grounded by Hose

■ B. F. Goodrich Co., Akron, O., has introduced a sandblast hose designed to overcome the accumulation of static by the use of a ground wire.

Although hose does not completely eliminate static, a ground wire located in the heart of the hose wall tends to catch the discharges of static thus grounding them rather than passing them through the operator's body. Static punctures, instead of penetrating entirely through the hose wall with disastrous results, reach only as far as the wire, permitting the hose to continue in service with little damage.

Wall thickness of the hose is greater than the standard type to permit installation of wire without reducing the cushion effect of the tube. Construction consists of a tube, one ply of fabric, wire coils embedded in rubber of the same quality as the tube, three plies of fabric and the cover. Hose is available in sizes ranging from ¾ to 3 inches.

Wall thickness of illustrated Goodrich sandblast hose is greater than the standard type to permit installation of wire without reducing cushion effect of the tube

Limit Switch Is Sealed in Steel Case

■ Micro Switch Corp., Freeport, Ill., has placed on the market a compact, standard L-K precision limit switch with a rating of ½-horsepower up to 460 volts alternating current.

Switch is sealed into a steel case and actuated by a plunger sealed against the entrance of normal oil and water. The plunger has a total travel of ¼ inches, but the switch is actuated by a movement of only 0.001 inches in the forepart of this travel. The small size of this unit adapts it to unusual applications in automatic machine tool work or wherever precise limits or motion must be absolutely maintained. The size of the unit is 2¾ x 1 9/16 x 15/16 inches.

Tie Rods Hold Cam Unit Rigid

■ General Electric Co., Schenectady, N. Y., has placed on the market a new line of rotary cam switches developed primarily for use in conjunction with machine-tool equipment.

Switch consists of a series of cam bushings mounted on a shaft and supported by two end plates. The assembly is held rigid by tie rods attached to the plates. Steel-backed, silver-to-silver contacts contribute towards longer life. Supports for these contacts, mounted securely on tie rods, are insulated by tubes of high dielectric strength. Switch may be obtained with the maximum of ten circuits and with as many as twelve positions in 360 degrees of rotation.

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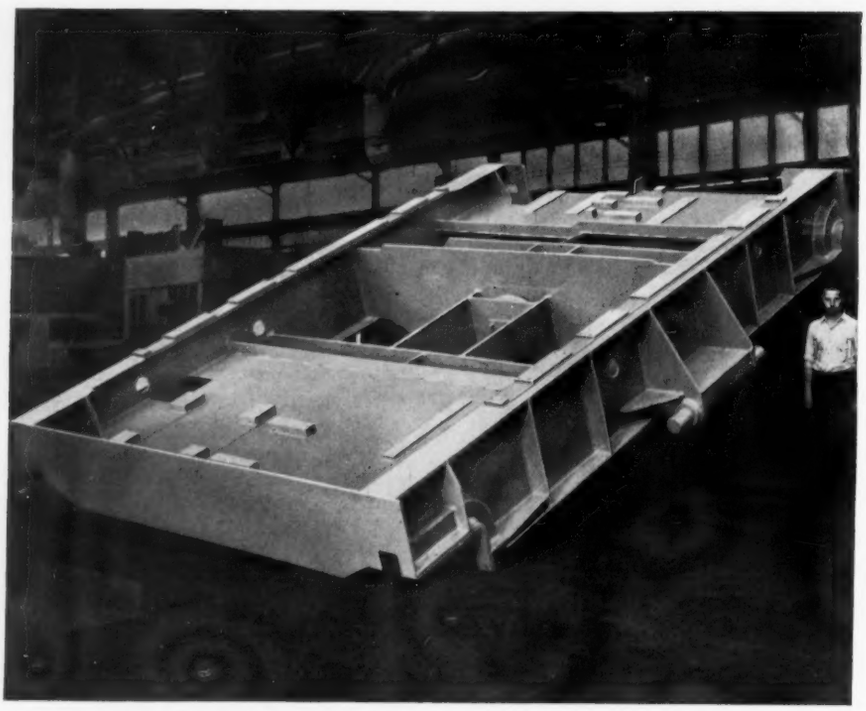

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MATERIALS HANDLING EQUIPMENT

Roller Conveyor Spring-Mounted

(*Concluded from Page* 56)

stacked and squared against the side guard of the piling bar and retractable end stop. This end stop is adjustable to suit the length of the sheet steel being handled and is made so that it disappears between the two parallel lines of spring-mounted roller conveyor. This action allows stacks of sheet steel to proceed to the end of the conveyor where they are removed by overhead crane to the next process.

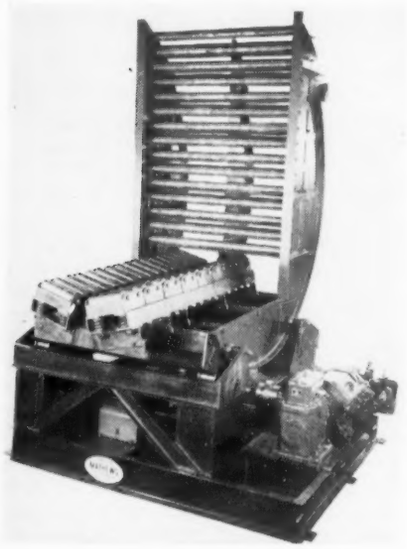
In Fig. 2 may be seen a close-up of the springs on which the individual rollers of the conveyor are mounted. It is claimed that this method of mounting results in absorption of the shock sustained by the rollers when these heavy loads of sheets pass over them.

Novel Upender for Handling Steel Coils

■ An innovation in upenders for handling steel coils is one just built recently. It incorporates a spring-mounted conveyor and is used for upending from a vertical to a horizontal position, or vice versa.

Unit loads handled by this device average 18,000 pounds, consisting of 48-inch wide strip steel coiled to 54-inch diameter. Roller conveyors of both troughed and horizontal sections are mounted on 4-inch outer diameter, ¾-inch diameter wire springs which are compressed to 2000 pounds.

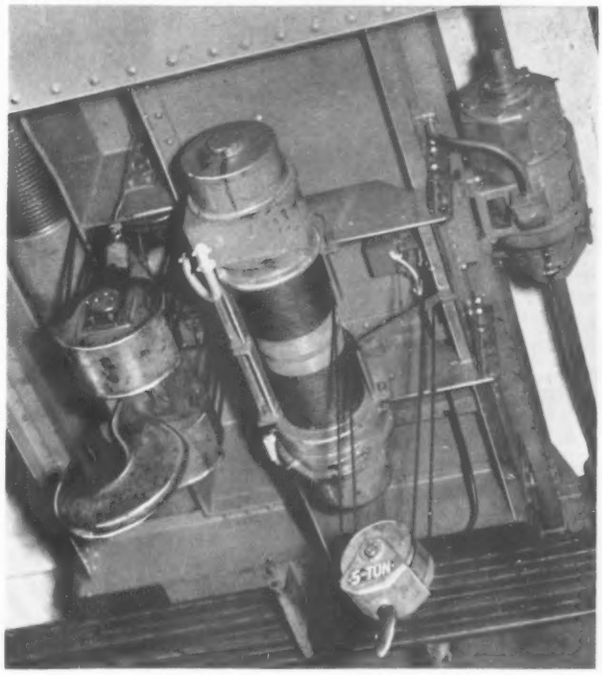
The roller conveyor in both sections incorporates 4¼-inch diameter rollers 62 inches long in the straight section and 12 inches long in the troughed section, each roller having a continuous load rating of 4000 pounds. The motor used in this machine is a 15 horsepower, 725 revolutions per minute, 230-volt direct current unit. A worm-gear drive is used with 30 to 1 reduction. The accessories also include a controller.



One of the first coil upenders to incorporate spring-mounted conveyors is driven by a 15-horsepower motor and worm-gear speed reducer. Photo courtesy Mathews Conveyer Co., Ellwood City, Pa.

Small Hoist Supplements 40-ton Crane

■ In an auto body plant this 40-ton, overhead P & H crane, built by Harnischfeger Corp., Milwaukee, was supplemented by a P & H 5-ton hoist, the new set-up permitting faster handling of the smaller loads and reduction of power consumption. Hoist, with variable speed unit, is controlled from crane cab as though an auxiliary crane hook



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SEATTLE

Reader Comments

(*Concluded from Page* 17)

months, let alone have a piece to eat. Sometimes fortune smiled in the shape of a pair of shoes. Trudging through the woods one day I was stopped by Bolsheviks and seized as a spy. I was a stranger and could offer no explanation of my presence, so they had only one alternative, to shoot me. A lieutenant handed me a shovel and said: "You make your own bed, and we'll put you to sleep."

I could do nothing but follow instructions. The scene comes back to me clearly. Just as my execution was about to be carried out, a second rebel army invaded the camp, and in the ensuing fighting I managed to escape. Wandering further I was captured a second time, after three days managing to identify myself and being allowed to proceed. With great difficulty I reached the Russian-Polish border and, waving a white sheet to indicate my peaceful intent, crossed and trudged on to Warsaw. It had taken three months to make the journey.

It was the winter of 1919, Christmas, and the subzero weather made it anything but pleasant with the too few clothes I possessed. I went to the head of the railroad station, told him my story and that I could go no further. He gave me my fare to Germany but could not guarantee me a place on the train. After an all day wait in the biting cold, at 1 o'clock in the morning, a train arrived, so loaded with passengers that the only place to ride was on top of the cars. In company with some transient soldiers, I rode on top of the cars the rest of the night. I stayed with the Polish soldiers on the German border because I did not have a passport and the German patrol would not let me enter Germany unless I had the proper papers. With the soldiers' help I finally crossed the border, arrived home in Germany in the spring.

The long months of privation had made serious inroads on my health, so, after looking up my father and being welcomed home I spent a few weeks recuperating, in the meantime observing conditions in Germany with a view to getting myself some sort of work.

Labor uprisings were numerous, strikes were frequent and conditions generally so unsettled that I saw no future in attempting to land a job there. My father had friends in the United States, and from what I had heard that seemed to be my land of opportunity. When my health recovered, I decided at once to set out for America and after obtaining a passport sailed Jan. 6, 1923 for New York.

I met a farmer from Minnesota on board, a German-born American citizen. He talked to me about America and assured me I would not be disappointed. We became fast friends. After a short stay on Ellis island I was released and came on to New York. A short stay there convinced me it was not the place for me because it is a city whose streets are filled with people of all nationalities, speaking their own languages. I did not like this; I wanted to be a good American and, in order to be a good American you have to do everything the American way. I took a train to Lansing, Mich., where, through friends of my father, I obtained my first job, Jan. 25.

Once again I was in a strange country, unable to speak the language and only 21. But I was no longer a prisoner and for the first time in my life felt this might be the place of my dreams. I had a job. It did not matter whether I belonged to any particular organization and I did not have to pay tribute to a union in order to work. I went to night school to learn the American language, eager to get acquainted and anxious to become a good citizen.

After a short time working as a sweeper, unloading steel and other menial tasks, I was given a helper's job on machinery. The plant manufactured screw machine parts. A few months later I was promoted to machine operator. Working as long as I wanted to, usually 12 hours a day, every evening for two hours I attended night school, the rest of the time divided between study and sleep.

One year from the day I arrived in America I became a tool setup man and a short time later, after I had mastered the language, was appointed foreman.

In 1928 I received my final citizenship papers. Since I did not know exactly where I was born — only that it was "somewhere in Germany"—the papers making me a citizen of the country which was giving me a chance were issued to "a man without a country". Now I could glimpse the goal I had so hoped could be reached.

By this time I had been promoted to night superintendent over about 500 men. Everything was going along fine; then came the depression. Most American people were much discouraged, but in spite of that, from my past experiences, I knew we were still better off at the bottom of the depression than most European countries were at the height of a boom. We still had three square meals a day, plenty of clothes and we were, above all, still driving automobiles.

In 1934 I was offered the opportunity to come to Detroit as factory manager of a new company making screw machine parts. It was a wonderful opportunity, so good in fact, that I hesitated before accepting it because it seemed almost too good to be true. But I finally made the change and have never regretted it.

So, in the brief space of 14 years, opportunity has been kind to me and I shall never forget the fact that such opportunity is characteristic of the American way.

JONATHAN KLUDT
General Manager,
Lincoln Engineering Co.,
Detroit.

Problems of Industrial Gas Discussed by Experts

(*Concluded from Page* 58)

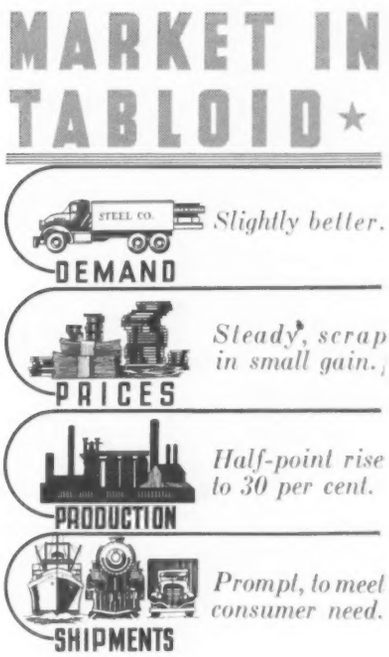
knuckles. Thirty-seven steam hammers and 17 board drop hammers are served by 65 slot-type furnaces and two continuous billet furnaces. After a good deal of experimentation with gas-fired, slot-type furnaces, which proved unsatisfactory because of a tight scale formation, a combination oil and gas-fired unit was evolved which has been giving quite satisfactory results.

Discussion of the relative merits of both long and short flames in industrial heating was presented by A. M. Capper, Continental Roll & Steel Foundry Co., Coraopolis, Pa. Proponents of the long or luminous flame claim this type results in greater heat transfer in a shorter time than the short or clear flame. This was shown definitely by tests using a solid steel roll and a bundle of sheets, by placing thermocouples in these masses both in the center and near the edge. However, lower first costs are obtained by using the clear flame in most cases. Each application must be considered an individual case, concluded the speaker.

Winding up the session, Frank Leahy, fuel engineer, Youngstown Sheet & Tube Co., Youngstown, O., spoke on "How a Fuel Engineer Looks at Natural Gas". Problems arise in the steel mill because of the various types of fuels used, according to the speaker. These include natural gas, coke oven gas, blast furnace gas and liquid fuels, each of which has a different heat content and presents its problems to the furnace operator. The gas dispatcher must use all of these fuels to the best advantage. Coke gas is used first when possible, but under conditions prevailing at present, the ovens use nearly all the gas they produce in heating the coal, as well as keeping the idle ovens warm. Under normal operations, the ovens use only approximately 38 per cent of the gas they produce. Change in the gas used on heating furnaces used is undesirable because of the varying volume required.

Signs Indicate Better Steel Situation

Scrap Makes Gain; Rail, Ship Tonnage Placed; Output Up



■ BETTER feeling exists in the steel market although volume of buying has not increased materially. In the judgment of steelmakers March bookings are slightly better than in February and are more diversified.

Probably the greatest drawback is lagging demand for automotive steel, which seasonally should be heavy. This is partly compensated by steady requirements of agricultural equipment makers and stove makers, the latter coming into the market for increasing tonnage.

Announcement by the interstate commerce commission of a measure of relief in freight rates is disappointing to the carriers because of its small size. However, it removes one uncertainty from the general situation and some pent-up demand for rails and cars may be expected to come out soon. Railroad income is not expected to be increased sufficiently by the new rates to allow buying much beyond necessities. Exemption of bituminous coal, coke and iron ore relieves the steel industry of added burden in assembly costs.

A western road has placed 15,000 tons of rails with Chicago mills and an eastern line soon will inquire for about 20,000 tons. The Colorado rail mill is starting rail production on accumulated orders. Placing of orders for cars by a New England road removes the last important inquiry in that field.

Award of 20 steel river barges by Inland Waterways Corp. brings 14,460 tons of steel, mostly plates, into the market. The contracts fall in the Pittsburgh, Chicago and Birmingham districts, thus distributing the steel. Plates for Standard Oil tankers placed some time ago are expected to be distributed soon. Shipbuilders are asked to submit new bids on eight remaining cargo boats for the maritime commission, former bids being considered too high.

Steel production continues to hold steady, with slight variation, indicating uniform demand, though at a low rate. The national operating rate last week showed a rise of half a point, to 30 per cent. At Chicago the rate increased 1 point to 27.5 per cent, at Birmingham 3 points to 61, at St. Louis 9 points to 37 and at Cincinnati 22 points to 32. Pittsburgh dropped 1 point to 26 per cent, Eastern Pennsylvania 1 point to 29, Buffalo 2.5 points to 18.5 and Detroit 2 points to 33. There was no change at Youngstown at 29 per cent, Wheeling at 38, Cleveland at 28 and New England at 15.

Automobile production increased slightly last week, to a total of 57,438, compared with 54,440 the preceding week. General Motors made 24,500 units, compared with 23,750 the preceding week; Chrysler, 13,475 compared with 11,150; Ford, 12,060 compared with 11,500 and all others 7403 compared with 8040.

STEEL'S sixteenth annual presentation of statistics of steel distribution shows little change in relative rank of important consuming industries in 1937. Automotive builders continue in first place, with building and railroads next and containers fourth. Exports presented the most important change in rank, rising from seventh to fifth place.

The steel industry in February operated at 31.73 per cent of capacity, compared with 29.14 per cent in January, a gain of 9 per cent. This gave an average weekly production of 425,811 gross tons of ingots, compared with 391,031 tons in January, which was almost sufficient to carry February total production to the level of January, in spite of three less working days. February total production was 1,703,245 tons, compared with 1,732,266 tons in January. The February figure is 60 per cent lower than a year ago, when February output was 4,413,832 tons.

Shipments of finished steel by the United States Steel Corp. in February were at practically the same rate as in January but because of the shorter month the total, 474,723 tons, was 43,599 tons under the January figure. It was less than half the tonnage shipped in February, 1937, which amounted to 1,133,724 tons.

Strength in scrap has appeared in the Chicago market, raising the price of steelmaking grades while other centers were unchanged, brought the first increase since January in the scrap composite, raising it 8 cents, to $13.21. The iron and steel composite declined 1 cent to $38.83 and the finished steel composite is stationary at $61.70.

COMPOSITE MARKET AVERAGES

	Mar. 12	Mar. 5	Feb. 26	One Month Ago Feb., 1938	Three Months Ago Dec., 1937	One Year Ago Mar., 1937	Five Years Ago Mar., 1933
Iron and Steel	$38.83	$38.84	$38.84	$38.90	$38.88	$39.92	$27.92
Finished Steel	61.70	61.70	61.70	61.70	61.70	60.70	45.60
Steelworks Scrap	13.21	13.13	13.25	13.54	13.24	20.95	6.47

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	March 12, 1938	Feb. 1938	Dec. 1937	March 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.40c
Steel bars, Chicago	2.50	2.50	2.50	2.50
Steel bars, Philadelphia	2.75	2.75	2.75	2.74
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.35
Shapes, Pittsburgh	2.25	2.25	2.25	2.20
Shapes, Philadelphia	2.465	2.465	2.465	2.455
Shapes, Chicago	2.30	2.30	2.30	2.30
Tank plates, Pittsburgh	2.25	2.25	2.25	2.20
Tank plates, Philadelphia	2.445	2.445	2.445	2.435
Tank plates, Chicago	2.30	2.30	2.30	2.30
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.35
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	3.10
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.70
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.45
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	3.25
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.85
Plain wire, Pittsburgh	2.90	2.90	2.90	2.85
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$4.85
Wire nails, Pittsburgh	2.75	2.75	2.75	2.70

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$36.40
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	36.40
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	36.40
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	46.20

Pig Iron

	March 12, 1938	Feb. 1938	Dec. 1937	March 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$24.85
Basic, Valley	23.50	23.50	23.50	23.10
Basic, eastern del. East. Pa.	25.34	25.34	25.34	24.76
No. 2 fdry., Pittsburgh	25.21	25.21	25.21	24.80
No. 2 fdry., Chicago	24.00	24.00	24.00	23.20
Southern No. 2, Birmingham	20.38	20.38	20.38	19.88
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	23.19
No. 2X eastern, del. Phila.	26.215	26.215	26.215	25.635
Malleable, Valley	24.00	24.00	24.00	23.60
Malleable, Chicago	24.00	24.00	24.00	23.20
Lake Sup., charcoal, del. Chicago	30.24	30.24	30.24	28.95
Gray forge, del. Pittsburgh	24.17	24.17	24.17	23.75
Ferromanganese, del. Pittsburgh	107.49	107.49	107.49	90.80

Scrap

Heavy melting steel, Pittsburgh	$13.75	$14.15	$13.40	$22.40
Heavy melt. steel, No. 2, E. Pa.	12.75	13.25	13.13	18.75
Heavy melting steel, Chicago	12.25	12.15	12.40	20.90
Rails for rolling, Chicago	15.25	15.25	14.25	22.25
Railroad steel specialties, Chicago	14.25	14.85	15.75	22.35

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.30	$4.05
Connellsville, foundry, ovens	5.25	5.25	5.25	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	10.25

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars	2.97½c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars	3.82½c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars	4.42½c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.00c
Gary	3.10c
Detroit, delivered	3.21c
Philadelphia, del.	3.30c
New York, del.	3.34c
St. Louis, del.	3.23c
Granite City, Ill.	3.20c
Pac. base pts. f.o.b. cars	3.62½c

Cold Rolled No. 20

Pittsburgh	3.45c
Gary	3.55c
Detroit, delivered	3.66c
Philadelphia, del.	3.75c
New York, del.	3.79c
St. Louis	3.68c
Granite City, Ill.	3.65c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific basing points, f.o.b. cars	2.82½c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46½c
New York, del.	2.51¼c
Boston, delivered	2.64½c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific coast basing pts., f.o.b. cars	2.82½c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific coast basing pts., f.o.b. cars	3.02½c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.75c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads. base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.50c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni.	1.10
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	0.15
6100 bars	1.20
6100 spring	0.85
Cr. N., Van.	1.50
Carbon Van.	0.85
9200 spring flats	0.15
9200 spring rounds, squares	0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/8-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to 7/8-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
7/8-inch and smaller, Pitts., Chi., Cleve.	65-5 off

Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts, Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to 5/32-inch incl.	47.00
Do., over 5/32 to 11/64-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.63

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethelehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	23.30	.....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	41.80
New Jersey	51.00

Ohio

First quality	43.70
Intermediate	39.90
Second quality	35.15

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	59.85
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$30.00
Wire cut	$28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$49.00
Chem. bonded chrome	49.00
Magnesite brick	69.00
Chem. bonded magnesite	59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$20.00
Do., for barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd.	$102.50
Do., Baltimore, base	102.50
Do., del. Pittsburgh	107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot	33.00
Do., New Orleans	33.00
Do., 26-28%, Palmerton	39.00
Ferrosilicon, 50% freight allowed, c.l.	69.50
Do., ton lot	80.50
Do., 75 per cent Spot, $5 a ton higher.	126.00
Silicoman., 2½ carbon	106.50
2% carbon 111.50; 1%,	121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.50
Ferrotungsten, stand., lb. con. del. cars	1.95-2.00
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton	142.50
Contract, ton lots	145.00
Spot, ton lots	150.00
Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill	0.95
Molybdate, lb. cont. f.o.b. mill	0.80
Technical molybdenum trioxide, 53 to 60% molybdenum, f.o.b. mill	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper—Electro, del. Conn.	Copper—Lake, del. Midwest	Copper—Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Mar. 5	10.00	10.12½	9.52½	41.75	42.05	4.50	4.35	4.75	20.00	13.75	35.00
Mar. 7	10.00	10.12½	9.52½	41.75	42.10	4.50	4.35	4.75	20.00	13.75	35.00
Mar. 8	10.00	10.12½	9.52½	41.75	42.10	4.50	4.35	4.75	20.00	13.75	35.00
Mar. 9	10.00	10.12½	9.52½	42.00	42.37½	4.50	4.35	4.50	20.00	13.75	35.00
Mar. 10	10.00	10.12½	9.52½	41.62½	41.95	4.50	4.35	4.50	20.00	13.75	35.00
Mar. 11	10.00	10.12½	9.52½	40.87½	41.20	4.50	4.35	4.50	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c *Conn. copper*

Sheets

Yellow brass (high)	16.62½
Copper, hot rolled	18.12½
Lead, cut to jobbers	7.75
Zinc, 100-lb. base	10.00

Tubes

High, yellow brass	19.37½
Seamless copper	18.62½

Rods

High yellow brass	12.62½
Copper, hot rolled	14.62½

Anodes

Copper, untrimmed	15.37½

Wire

Yellow brass (high)	16.87½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

New York	5.95-6.10
Cleveland	6.25-6.50
*Chicago	5.62½-5.87½
St. Louis	5.75-6.00

Heavy Copper and Wire

New York, No. 1	7.00-7.12½
Cleveland, No. 1	7.25-7.50
*Chicago, No. 1	7.25-7.50
St. Louis	7.25-7.50

Composition Brass Borings

New York	4.95-5.10

Light Copper

New York	5.00-5.12½
Cleveland	5.50-5.75
*Chicago	5.37½-5.62½
St. Louis	5.25-5.50

Light Brass

Cleveland	3.00-3.25
*Chicago	3.62½-3.87½
*St. Louis	3.50-4.00

Lead

New York	3.50-3.75
Cleveland	3.00-3.25
Chicago	3.00-3.25
St. Louis	3.25-3.50

Zinc

*New York	1.87½-2.00
Cleveland	1.75-2.00
*St. Louis	1.87½-2.00

Aluminum

Borings, Cleveland	5.75-6.00
Mixed cast, Cleve.	8.75-9.00
Clips, soft, Cleve.	12.25-13.00
Mixed cast, St. L.	8.50-8.75

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl	10.25
Stand. No. 12 alum.	16.00-16.50

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Struc-tural Shapes	Floor Plates	Sheets Hot Rolled No. 10	Sheets Hot Roll Ann. No. 24	Sheets Galv. No. 24
Boston	4.20c	4.40c	5.40c	4.08c	4.07c	5.73c	4.15c	4.90c	5.10c
New York (Metropolitan)	4.12	4.32	4.32	4.00	3.97	5.60	4.07	4.50	5.00
Philadelphia	4.00	4.10	4.35	3.90	3.90	5.25	4.00	4.65	4.90
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.15	4.35	4.60	4.05	4.05	5.65	4.10	4.70	5.35
Buffalo	3.90	4.22	4.22	3.92	3.80	5.52	3.97	4.80	5.35
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.16	4.16	3.86	3.86	5.46	3.91	4.66	5.31
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.05	4.25	4.25	3.95	3.95	5.55	4.00	4.75	5.40
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.25
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.09	4.34	4.34	3.99	3.99	5.59	4.09	4.84	5.49
Kansas City	4.34	4.59	4.59	4.24	4.24	5.84	4.10	4.85	5.50
Memphis	4.31	4.51	4.51	4.21	4.21	5.85	4.26	5.01	5.66
Chattanooga	4.21	4.41	4.41	4.11	4.11	5.91	4.16	4.06	4.66
Tulsa, Okla.	4.79	5.04	5.04	4.69	4.69	6.29	4.79	5.54	6.19
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	5.96	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.15	6.55	4.25	4.25	6.15	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	6.20	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.55

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed) 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars 2300	SAE Cold Drawn Bars 3100
Boston	3.845c	4.65c	4.50c	7.97c	6.52c	6.27c	8.37c	8.97c	7.52c
New York	3.92	4.57	4.32	7.82	6.37	6.12	....	9.00	7.55
Philadelphia	3.88	4.53	4.25	....	....	....	....	....	....
Baltimore	....	4.50	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.79	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.50	4.07	7.91	6.46	6.21	9.31	8.92	7.47
Chicago	3.87	4.30	4.05	7.60	6.15	5.90	8.00	8.60	7.15
Minneapolis	....	4.77	4.25	7.95	6.50	8.97	9.57	9.17	7.72
Milwaukee	....	4.41	4.16	7.81	6.36	6.11	8.21	8.81	7.36
St. Louis	3.96	4.54	4.29	7.94	6.49	6.24	8.34	8.94	7.49
Kansas City	4.37	4.79	....	....	....	....	....	....	....
Memphis	....	4.80	....	....	....	....	....	....	....
Chattanooga	....	4.86	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.24	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, March 10

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si...	$28.81 5 15 0	$18.02	2 5 0
Basic bessemer.....	.....	.....	.....
Hematite, Phos. .03-.05	32.57 6 10 0*	17.82	2 4 6
Billets.....	$39.45 7 17 6	$43.01	5 7 6
Wire rods, No. 5 gage..	56.49 11 5 6	42.00	5 5 0
Standard rails.....	$50.73 10 2 6	$46.00	5 15 0
Merchant bars.....	2.63c 11 15 0	1.91c	5 5 0
Structural shapes.....	2.38c 10 12 6	1.76c	4 17 6
Plates, †¼ in. or 5 mm.	2.59c 11 11 3	2.22c	6 2 6
Sheets, black, 24 gage or 0.5 mm.....	3.14c 14 0 0	2.81c	7 15 0*
Sheets, gal., 24 ga., corr.	3.75c 16 15 0	3.44c	9 10 0
Bands and strips.....	2.97c 13 5 0	1.91c to 1.99c	5 5 0 to 5 10 0
Plain wire, base.....	4.37c 19 10 0	2.22c to 2.63c	6 2 6 to 7 5 0
Galvanized wire, base..	5.21c 23 5 0	2.84c to 2.94c	7 17 6 to 8 2 6
Wire nails, base.....	4.14c 18 10 0	2.53c to 2.71c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 5.64 1 2 6	.....	.....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5.	$27.30	5 9 0(a)	$17.81	563.50	$21.99	650	$25.44 63
Basic bess. pig iron..	25.05	5 0 0(a)	.....	.....	.....	.....	28.06 (b) 69.50
Furnace coke.....	8.14	1 12 6	5.97	189	7.17	215	7.67 19
Billets.....	39.45	7 17 6	26.54	840	32.45	960	38.97 96.50
Standard rails.....	2.26c	10 2 6	1.61c	1,150	2.06c	1,375	2.38c 132
Merchant bars.....	2.56c	11 9 0	1.51c	1,080	1.65c	1,100	1.98c 110
Structural shapes....	2.47c	11 0 6	1.48c	1,055	1.65c	1,100	1.93c 107
Plates, †¼-in. or 5 mm.....	2.62c	11 14 3	1.89c	1,350	2.06c	1,375	2.29c 127
Sheets, black.....	3.52c	15 15 0§	2.19c	1,565‡	2.36c	1,575‡	2.59c 144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.....	4.14c	18 10 0	3.15c	2,250	4.50c	3,000	6.66c 370
Plain wire.....	4.37c	19 10 0	2.32c	1,660	2.48c	1,650	3.11c 173
Bands and strips....	2.73c	12 4 0	1.69c	1,210	2.32c	1,550	2.29c 127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite. °Close annealed.

**Gold pound sterling carries a premium of 64.4 per cent over paper sterling.

—The Market Week—

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Birmingham, No. 2	9.00
Bos. dock No. 1 exp.	13.50
N. Eng. del. No. 1	12.50
Buffalo, No. 1	12.50-13.00
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.25-12.50
Cleveland, No. 1	11.50-12.00
Cleveland, No. 2	10.50-11.00
Detroit, No. 1	9.00- 9.50
Eastern Pa., No. 1	14.00-14.50
Eastern Pa., No. 2	12.50-13.00
Federal, Ill.	10.75-11.25
Granite City, R. R.	12.50
Granite City, No. 2	11.00-11.50
Los Angeles, No. 1	12.00
Los Angeles, No. 2	10.50
New York, No. 1	†11.00
N. Y. dock No. 1 exp.	12.50
Pitts., No. 1 (R. R.)	15.50-16.00
Pitts., No. 1 (dlr.)	13.50-14.00
Pittsburgh, No. 2	12.50-13.00
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	11.00-11.50
San Francisco, No. 1	10.00
Seattle, No. 1	8.00
Toronto, dlrs. No. 1	10.00
Valleys, No. 1	13.25-13.75

COMPRESSED SHEETS

Buffalo, dealers	10.50-12.00
Chicago, factory	11.00-11.50
Chicago, dealer	10.00-10.50
Cleveland	11.00-11.50
Detroit	9.75-10.25
E. Pa., new mat.	14.50
E. Pa., old mat.	9.50-10.00
Los Angeles	14.50-16.50
Pittsburgh	13.00-13.50
St. Louis	6.75- 7.25
Valleys	12.75-13.00

BUNDLED SHEETS

Buffalo	11.50
Cincinnati, del.	9.00- 9.50
Cleveland	8.00- 8.50
Los Angeles	11.50-14.50
Pittsburgh	12.50-13.00
St. Louis	6.00- 6.50
Toronto, dealers	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.25- 7.75
Cincinnati	5.50- 6.00
Detroit	6.50- 7.00
† Los Angeles	4.00
St. Louis	5.00- 5.50

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	17.50-18.00
Chicago (3 ft.)	15.00-15.50
Chicago (2 ft.)	15.50-16.00
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Los Angeles	18.00-22.00
Pitts, 3 ft. and less	17.75-18.25
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	12.00-12.50
Cleveland	16.00-16.50
Pittsburgh	15.75-16.25
St. Louis	12.00-12.50
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	10.50-11.00
Chicago, net	8.50- 9.00
Cincinnati, dealers	6.50- 7.00
Detroit, net	7.50- 8.00
Eastern Pa.	12.50-13.00
New York, fdry.	†8.00- 8.50
St. Louis	8.00- 8.50
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	16.50-17.00
Chicago, leaf	15.00-15.50
Eastern Pa.	17.00-17.50
Pittsburgh	17.75-18.25
St. Louis	14.00-14.50

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	13.00-13.50

RAILROAD SPECIALTIES

Chicago	14.00-14.50

LOW PHOSPHORUS

Buffalo, crops	17.00-17.50
Cleveland, crops	19.50-20.50
Eastern Pa., crops	18.50-19.00
Pittsburgh, crops	17.50-18.50

FROGS, SWITCHES

Chicago	12.00-12.50
St. Louis, cut	12.00-12.50

SHOVELING STEEL

Federal, Ill.	10.75-11.25
Granite City, Ill.	11.00-11.50
Los Angeles (net)	16.00-18.00
Toronto, dealers	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	9.50-10.00
Cincinnati, No. 2	9.50-10.00
Eastern Pa., No. 1	15.50-16.00
St. Louis, No. 1	8.50- 9.00
St. Louis, No. 2	12.00-12.50
Toronto, No. 1 dlr.	16.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	10.75-11.25
Cincin., No. 1, deal.	8.50- 9.00
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	7.50- 8.00
Detroit, No. 1, new	8.50- 9.00
Valleys, new, No. 1	12.50-13.00
Toronto, dealers	7.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	6.25- 6.75
Chicago	6.00- 6.50
Cincinnati, dealers	4.00- 4.50
Cleveland	6.50- 7.00
Detroit	4.50- 5.00
Eastern Pa.	7.00- 7.50
Los Angeles	4.00- 8.00
New York	†3.50
Pittsburgh	8.00- 8.50
St. Louis	4.50- 5.00
Toronto, dealers	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†1.85
Buffalo	6.50- 7.00
Cincinnati, dealers	3.50- 4.00
Cleveland	7.50- 8.00
Detroit	4.50- 5.00
Eastern Pa.	6.50- 7.00
New York	†4.50- 5.00
Pittsburgh	7.00- 7.50
Toronto, dealers	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	6.50- 7.00
Chicago	5.25- 5.75
Cincinnati, dealers	3.50- 4.00
Cleveland	7.50- 8.00
Detroit	4.50- 5.00
E. Pa., chemical	12.00-13.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers	7.50

PIPE AND FLUES

Cincinnati, dealers	7.00- 7.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.00- 9.50
Chicago, net	8.50- 9.00
Cincinnati	6.00- 6.50
Eastern Pa.	12.50-13.00
New York	†8.50- 9.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†7.00
Buffalo	10.50-11.00
Cleveland	11.00- 11.50
Detroit	7.50- 8.00
Los Angeles	9.00
Pittsburgh	12.75-13.25

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.00-15.50

ARCH BARS, TRANSOMS

St. Louis	14.00-14.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	12.00-12.50
Chicago, elec. fur.	11.50-12.00
Eastern Pa.	12.50-13.00
St. Louis	8.00- 8.50
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	16.00-16.50
Boston district	†14.00
Chicago, net	17.00-17.50
Eastern Pa.	21.50-22.50
St. Louis	17.50-18.00

SHAFTING

Boston district	†14.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.00
Buffalo, steel	16.00-16.50
Chicago, iron	14.00-14.50
Chicago, rolled steel	14.50-15.00
Cincinnati, iron	15.00-15.50
Eastern Pa., iron	15.50
Eastern Pa., steel	17.00-17.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	17.75-18.25
St. Louis, iron	12.00-12.50
St. Louis, steel	14.50-15.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2.	12.00
N. Eng. del. textile.	15.00-15.50
Buffalo, cupola	13.50-14.00
Buffalo, mach.	15.00-15.50
Chicago, agri. net	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net.	11.50-12.00
Cincin., mach. cup.	11.00-11.50
Cleveland, mach.	17.00-17.50
Eastern Pa., cupola	15.50-16.00
E. Pa., mixed yard	13.50-14.00
Los Angeles	13.00-14.00
Pittsburgh cupola	16.00-16.50
San Francisco, del.	13.50-14.00
Seattle	8.00
St. Louis, No. 1	10.00-10.50
St. L., No. 1, mach.	11.00-11.50
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break.	†9.00- 9.50
N. Eng., del.	11.50-12.00
Buffalo, break	11.00-11.50
Cleveland, break.	14.00-15.00
Detroit, break.	10.50-11.00
Detroit, auto net	12.50-13.00
Eastern Pa.	14.00-14.50
Los Angeles	13.00-14.00
New York, break.	†10.50-11.00
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	16.00
Buffalo	13.50-14.00
Chicago, R. R.	14.00-14.50
Cincin., agri. del.	10.50-11.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R.	15.50-16.00
Los Angeles	13.00-14.00
Pittsburgh, rail	14.25-14.75
St. Louis, R. R.	13.00-13.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	13.50-14.00

LOCOMOTIVE TIRES

Chicago (cut)	14.50-15.00
St. Louis, No. 1	13.75-14.25

LOW PHOS. PUNCHINGS

Buffalo	16.00-16.50
Chicago	14.00-14.50
Eastern Pa.	18.00-19.00
Pitts. (lt. & hvy.)	17.00-18.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% non.	45.00
So. African, 50-52% nom.	45.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 76

New York—Delivered prices on sheets here will be increased two and half cents per 100 pounds as result of the newly announced freight rate advance. Instead of the present rate from Pittsburgh to New York of 34 cents per 100 pounds, the new rate will be 36.5 cents. This new rate is based on a 10 per cent increase of the 33 cent rate which prevailed before the rate advance last November and makes allowance for the rule simplifying fractions.

In explanation of the latter, this ruling provides that fractions under 0.25 cents can be eliminated, that fractions from 0.25 to 0.74 cents can be figured at ½ cent and that from 0.75 cents and up at 1 cent. Ten per cent of 33 makes for an increase of 3.3, but in the light of this ruling this increase may be changed to 3.5.

General expectation is that the effective date will fall somewhere around the middle of April. On the basis of the proposed changes, No. 10 hot-rolled will be 2.765c, delivered New York; No. 24 hot-rolled annealed, 3.515c; and No. 24 galvanized at 4.165c. No. 10 cold-rolled will be quotable at 3.365c and No. 20, at 3.815c.

New buying continues spotty, although slightly higher on an average. Bids were open March 11 on 2001 lockers for Brooklyn college, with bids pending March 23 on steel bins for the army base in Brooklyn.

Pittsburgh—The brightest spot in the sheet market is in exports which continue fairly strong. March sheet production will probably be greater than in February, but it will not be up to normal seasonal increase. Inquiries entering the market now are more numerous than previously but orders have shown no substantial rise. Releases on previous orders are still slow, with farm equipment probably the most active division. Galvanized sheet production rate continues at around 35 per cent, but general sheet production is probably between 25 and 30 per cent.

Cleveland—Specifications for hot and cold-rolled sheets continue erratic, fluctuating considerably from day to day. However, one seller reports aggregate tonnage booked so far this month is slightly more than the comparable period in February. The general feeling is that shipments this month will exceed last month by a substantial amount, due primarily to stimulating seasonal influences.

Chicago—While small gains are appearing in sheet demand from miscellaneous users, failure of the automotive industry to increase its commitments is restricting bookings and production. Heavier shipments for motor car use are looked for soon, but little more than a moderate pickup elsewhere is anticipated. Farm equipment manufacturers continue to provide steady demand.

Boston — Delivered sheet prices will advance slightly when the new freight rates from Pittsburgh become effective, but the advance is not large enough to warrant much buying to avoid such increases. The recent mild improvement in buying is maintained, but the aggregate volume is not impressive with industrial consumers buying only for immediate needs. More inquiry for steel lockers, shelving and shovels is appearing, while a leading range and stove manufacturer notes encouraging improvement in demand for its product, requiring enameled stock.

Philadelphia—The leading auto body builder has issued releases on several hundred tons of hot and cold-rolled sheets. Auto releases are generally slow, as indicated by curtailed operations in district plants. Other leading consumers, such as

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the radio and stove trades, likewise are providing little tonnage. Brisk demand is reported in galvanized sheets by the sheet metal trade, reflecting a seasonal condition.

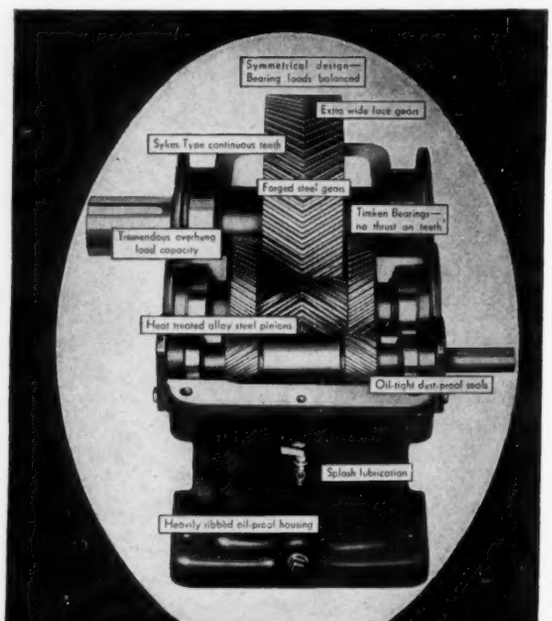
Buffalo—The sheet market fails to show any signs of leaving the current rut. Mills report small orders being placed to cover spot needs only. Talk of low inventories persists but there is no evidence of future buying. A little better demand is reported in warehouse business.

Cincinnati—Broad domestic demand for sheets is again showing improvement, attributed partly to seasonal gains in some lines. Export tonnages has sagged from the best February levels. Shipments on automotive orders, while heavier, continues disappointing. Most of the buying, including that by jobbers, indicates low inventories. Purchases so far this month run above 30 per cent of district capacity.

St. Louis—Producers and distributors of steel sheets report further slight expansion in specifications, but buying continues disappointing. While consumer stocks for the most part have been considerably reduced, there is no disposition to replenish except where material is needed to apply on business in hand or immediate prospect. Some stove plants have resumed operations on part schedules and are ordering out enameling stock and some other descriptions of sheets. Consumption by the farm implement interests, while much below last autumn, is still in good volume.

Birmingham, Ala.—Little change shown in sheets, with slight increase in operations the past three weeks. Manufacturers' sheets are in best demand. Roofing continues at slow pace.

Seattle—Sheets are reported as the most active warehouse line, although volume of sales is not outstanding. Demand is largely for galvanized and light black sheets, there being little call for heavy hot-rolled stock, including blue annealed.



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GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE, CLEVELAND, OHIO, U. S. A.

Strip

Strip Prices, Page 77

New York—Cold strip buying continues slack, although in spots a few sellers report a slightly broader demand. In the main, however, the tempo of business is unchanged with consumers buying only for immediate needs for prompt delivery. Re-rollers are not placing much hot strip tonnage.

Cleveland—Demand for wide and narrow strip from auto builders and suppliers has failed to show improvement. Buying continues to represent only actual needs and for prompt delivery. Inventories of most consumers are said to be substantially reduced. March as a whole is expected to show a moderate improvement over February, as a result of a general increased seasonal demand. Prices are unchanged.

Chicago—Improvement in strip demand still is retarded by absence of appreciable gains in automotive buying. Occasional slight upturns are noted in needs of smaller users, but expansion in total consumption is slow. Heavier shipments to the automotive industry are looked for later this month.

Boston—Cold strip mill operations, closely keyed to the trend of incoming volume, vary from day to day, but do not average better than 30 per cent of capacity, there being slight improvement in buying. Despite the stagnant demand, ultimate consumption now prevailing is still ahead of current production. There is practically no forward buying and hand-to-mouth orders are for prompt shipment. Mill prices for narrow

cold strip are firm, but some scattered shading among jobbers is reported. Hot strip buying is sluggish.

Philadelphia — Other than for routine requirements, which continue restricted, narrow strip shows comparatively little life, though sellers maintain March bookings are equal to the February volume. Prices are firm.

Plates

Plate Prices, Page 76

Pittsburgh—The plate market continues at about the same level, although a slight drop was noticed last week. Inquiries and orders are still slow.

Award of 20 open hopper barges and 217 barge hopper covers by Inland Waterways Corp., New Orleans with three builders will bring 14,460 tons of plates into the market. Part of this will be in this district, part in the Birmingham area and the remainder in the Chicago district.

Cleveland — Specifications for standard plates of wide and narrow widths have shown little improvement. However, sellers feel that small miscellaneous requirements for plant equipment and ship repair work will sustain operations during March on a generally higher level than February.

Chicago—While some betterment in plate consumption by railroads is anticipated, the upturn is thought likely to be gradual in view of the surplus of available equipment resulting from the decrease in freight traffic. Plates are moving in slightly larger lots to railroad shops for repair work, and requirements of structural fabricators have increased moderately.

Boston — Lacking inquiry for specified work, plate buying is centered around small miscellaneous requirements, with few full car orders placed. Shipyard specifications are steady, but this volume is well spread as to shipment and most goes to one Eastern Pennsylvania mill, with the exception of navy tonnage. Railroads are releasing sparingly. While not official, under the new freight schedules plates will probably be slightly higher in car lots, delivered Boston, 2 cents per 100 pounds higher or 2.68c per pound.

New York—An increase of 1 cent per 100 pounds in the New York delivered price will result from the newly announced freight rate increases. The new price will be 2.55c, delivered, with allowance for the ruling which applies to fractions. Effective date for the rate increase will not be much before April 15, in trade opinion here. Little improvement is noted in new orders, although the placing of 665 freight cars by the Bangor & Aroostook will result in some new tonnage in the railroad field, which so far this year has been light.

Philadelphia—Bids are due March 15 on one to three tenders for the lighthouse department and March 22 on two coast guard cutters. Shipbuilders are refiguring the eight remaining cargo vessels for the maritime commission on which previous bids were too high. Sun Shipbuilding & Dry Dock Co., Chester, Pa., is expected to place the steel for Standard Oil tankers within four to six weeks. Pusey & Jones, Wilmington, Del., will soon place steel for an army dredge booked a few weeks ago. Little early railroad plate tonnage is expected to appear soon. The Pennsylvania is understood to have a supply for three months at its Altoona yards and the Reading has

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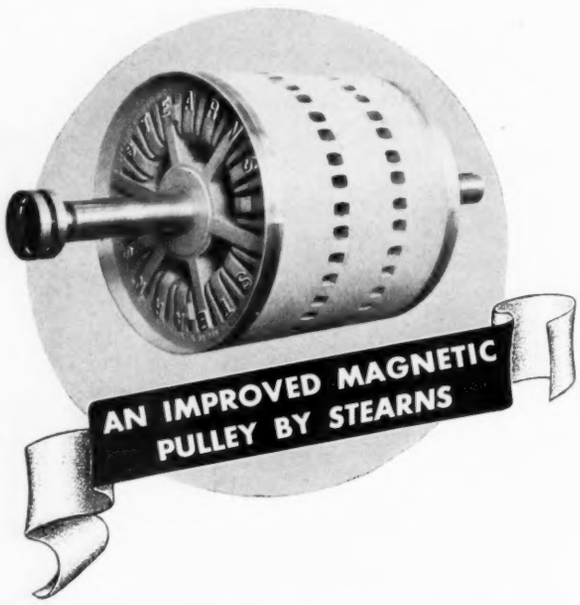
FORTY YEARS OF SUCCESSFUL SERVICE

material for repair of 300 freight cars. Tank builders are buying little.

San Francisco — Plate inquiries for the most part are for lots of less than 100 tons. The largest award went to Pacific Coast Engineering Co. for 150 tons in addition to 75 tons of shapes for two welded steel dump scows for the United States Engineer office, San Francisco. Bids have just been taken on 175 tons of 36-inch welded steel pipe for the treasury department, San Francisco. Awards so far this year aggregate 13,089 tons, compared with 9437 tons for the corresponding period in 1937.

Seattle—Placing of 1600 tons of plates and 1200 tons of cast iron pipe for the Seattle crosstown water system improvement, for which Puget Sound Machinery Depot, Seattle, was low, has been postponed on account of technicalities. The same firm has been awarded the contract for the Ruby dam 72-inch welded bypass, Seattle Light department, involving 100 tons of plates and 25 tons of shapes for trash racks. An eastern fabricator has been awarded a tank for McNeil Island prison, calling for 155 tons. Water tanks for Lowell and Monroe, Wash., bids this month, require 100 tons or more. Seattle Boiler Works is building a marine type boiler for an Alaska cannery and has other work in the shops totaling 100 tons. Fabricators report increased inquiry for work requiring plates.

STEARNS PIONEERED THE COOL MAGNETIC PULLEY



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Now—still greater cooling is provided by STEARNS better engineering through increased heat radiation area in a ribbed design which allows for deeper coils with more ampere turns and consequent greater magnetic pull.

Supporting arms to which the shaft is keyed are cast integral with the magnet body. Shaft is shouldered down from extra large long wearing alloy steel stock to absorb the stresses and strains from heavily loaded long conveyor.

A rugged magnetic pulley with power, economy and trouble-free operation at maximum peak loads.

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Formerly Magnetic Mfg. Co.
SEPARATORS DRUMS ROLLS CLUTCHES BRAKES MAGNETS
HIGH STEARNS DUTY
LARGEST EXCLUSIVE BUILDERS OF MAGNETIC EQUIPMENT

650 So. 28th Street Milwaukee, Wis.

Plate Contracts Placed

14,460 tons for 20 open hopper barges, Inland Waterways Corp., New Orleans, for delivery at Cairo, Ill.; 10 to Ingalls Iron Works, Birmingham, Ala., 6500 tons; five to Dravo Corp., Pittsburgh, 3250 tons; five to St. Louis Shipbuilding & Steel Co., St. Louis, 3250 tons; 217 barge hopper covers to Marietta Mfg. Co., Point Pleasant, W. Va., 1460 tons; bids Feb. 21.

2000 tons, tanks for Pan American Petroleum Co., Texas City, Tex., to unnamed fabricator.

570 tons, penstocks, Marshall Ford dam, Austin, Tex., to Chicago Bridge & Iron Co., Chicago.

300 tons, freighter for use on San Francisco bay to Moore Drydock Co., Oakland, Calif.

155 tons, storage tank, McNeil Island prison, Wash., to unnamed eastern fabricator.

150 tons, two welded steel dump scows, United States Engineer Office, San Francisco, to Pacific Coast Engineering Co., Oakland, Calif.

125 tons, (including 25 tons shapes); Seattle light department Ruby dam bypass, to Puget Sound Machinery Depot, Seattle.

100 tons, cannery boiler and miscellaneous, to Seattle Boiler Works, Seattle.

100 tons, 12 and 16-inch welded steel pipe, San Bernardino, Calif., to unnamed interest.

Unstated tonnage, 200,000-gallon standpipe, Prattsburg, N. Y., to Chicago Bridge & Iron Co., Chicago.

Unstated tonnage, 175,000-gallon steel standpipe, Nassau, N. Y., to Chicago Bridge & Iron Co., Chicago; bids Feb. 24.

Plate Contracts Pending

1300 tons, gas holder, Honolulu, Hawaii.

800 tons, inner lining and risers, tunnels and shafts, West Branch-Kensico tunnel, Delaware aqueduct, Putnam and Westchester counties, New York; bids March 24; board of water supply, New York; three contracts, 322, 323 and 324.

300 tons, pipe line, Colorado Springs, Colo.

175 tons, 36-in. welded steel pipe, Treasury Department, San Francisco; bids opened.

100 tons, 72-inch welded steel pipe, Ruby dam, Wash; bids opened.

100 tons or more, water tanks for Lowell and Monroe, Wash.; bids during March.

Unstated tonnage, 150,000-gallon tank on 60-foot tower, Groesbeck, Tex.; taking bids.

Bars

Bar Prices, Page 76

Chicago—Spotty improvement in steel bar demand continues, with farm equipment manufacturers the best consumers. Miscellaneous users also are better buyers of bars, but automotive purchases still lag. Despite the absence of backlogs mills

find it difficult to make immediate shipment, due to the small size of individual orders. This situation necessitates frequent roll changes, which result in delays in production.

Pittsburgh—The only orders now being received for steel bars are for immediate shipment to manufacturers and jobbers and little or no increase has been noticed in these orders over the past few weeks.

Cleveland — Producers of carbon and alloy steel bars report little improvement in specifications from auto partsmakers. Auto builders are still holding up releases on finished parts and until these begin to move at a more rapid pace no real improvement can be expected. Most sellers expect a slight increase in shipments during March, stimulated by additional demand from farm equipment manufacturers. Operations continue irregular.

Boston — Demand for commercial steel, alloy and forging bars has changed slightly with the trend mildly upward. Alloy material orders are more numerous, but the aggregate is small. Cold-finished bars continue to move steadily, but also in small shipments. Buying is close to consumer needs, demand being centered around specifications on which stocks are light. All such orders are for prompt delivery. Jobbers have worked stocks of some alloy bars down to a low point and are buying much in line with industrial consumer trends.

Philadelphia—Sellers of steel bars are booking occasional orders for carlots or less from widely diversified sources. Releases of some railroad requisitions are expected within 30 days after the new tariffs are filed. Warehouses are the most active outlet, in spite of heavy inventories.

New York—Once the new freight rate increases become effective, possibly around April 15, the delivered price here on commercial bars will be increased 2½ cents to 2.815c. This is based on a new rate of 36.5 cents per 100 pounds and takes into consideration the ruling with respect to fractions. Meanwhile, buying shows little change, authough general opinion still prevails that March will prove to be the best month so far this year.

Picatinny arsenal, New Jersey, closes March 23 on 117 tons of free machining steel bars and 20,400 pounds of strip, schedule 725.

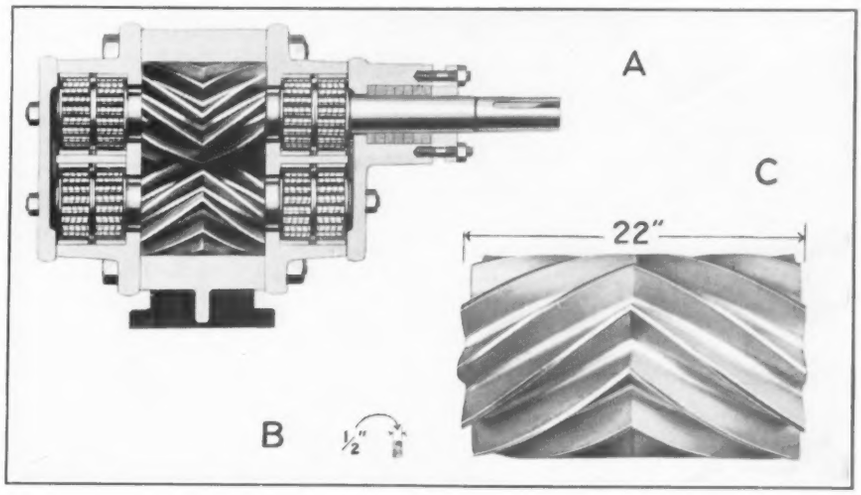
Pipe

Pipe Prices, Page 77

Pittsburgh—The pipe market continues dull, with little interest shown. Oil business has not shown up as well as had been expected, although some oil country tubing is now being shipped. However, pressure tubing, boiler tubes, and mechanical divisions are still quiet. Prices are stable and there seems to be no indication of pressure for reductions.

Chicago—Prices of cast iron pipe will be increased 60 cents a net ton here in the event the full 10 per cent freight increase is applied without limiting the total advance. While higher freight rates are expected to provide some stimulus to shipments, the amount of pending business is relatively small, and little more than a gradual seasonal upturn in business is looked for during the next 30 days. Only a few large jobs are pending, one of these being 1000 tons for Pontiac, Mich.

Boston—Cast pipe buying continues to display seasonal progress with more blanket covering, including Cambridge, Mass., with the district foundry, while Springfield and Gloucester, Mass., are closing on about 1000 tons. Utilities are buying in meager lots. Merchant steel pipe is steady with several construc-



2 GALLONS PER MINUTE *or* 2000 *with* SYKES HERRINGBONE PUMP ROTORS

Sykes continuous tooth herringbone gears have found an extensive use as pump rotors in a wide range of sizes and capacities, as illustrated by the two extremes shown above.

The smaller of the two pump rotors (Fig. B) is 1.083" O.D., ½" face, 24 D.P., and is one of a pair used in a pump having a capacity of 2 G.P.M. at 1750 R.P.M. The large rotor (Fig. C) is 13.991" O.D., 22" face, 1 D.P., and is the largest pump impeller made to date. This is one of a pair used in a Worthington pump for pumping bunker fuel oil. The pump has a capacity of 2,000 G.P.M. at 292 R.P.M., with 100 lbs. pressure and 14" suction and discharge.

Fig. A shows a longitudinal section of a Worthington Rotary Pump with Sykes rotors mounted in double roller bearings.

Sykes herringbone pump rotors are precision generated and, when properly fitted in a pump housing, run silently at high speeds. There is no end thrust and no trapping of liquid; they give high volumetric efficiency and uniform flow without appreciable pulsation.

Pump manufacturers and users are invited to send for engineering data giving rotor sizes, materials, formulas for determining capacities and other information. A request on your letterhead will bring this data without obligation.

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FARREL-BIRMINGHAM COMPANY, INC.
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The Gear with a Backbone

Behind the Scenes with STEEL

Scrap on Wheels

■ National Used Car Week is over now and all indications are that it was a Good Thyng, as are continued efforts to break the used car jam. We were particularly interested in the bonfires, such as they had in Milwaukee and South Bend, where they put all the old jallopies, junkers and knocked-down Erector sets in a pile and set fire to them. The result: less traffic menaces, stimulation of new car sales, pickup of steel production, etc. But we paled perceptibly when we took a close look at a photograph of the Milwaukee holocaust. Ye gods, they're burning better cars than the one we're driving!

Some Scope

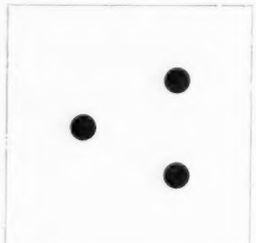
■ That every-other-week New Metal Products page is one of our favorite little departments in the magazine and we're always interested in hearing of the inquiries elicited by items featured thereon. F'rinstance, a letter just came from Raysteel Specialties Inc. of Cleveland, purveyors of the Sentry Stop-a-Draft pictured on the NMP page March 7. Just three days after the item appeared, Raysteel writes: "We have already received a great many inquiries from your readers requesting complete detailed information regarding our new product. These inquiries have come from all sections of the country." So there must be a lot of people waiting to read about that new metal product of yours, too.

High-drophobia

■ For the benefit of skyscraper addicts and untold millions of inquirers we might explain why anyone would lose a bet that Cleveland's Terminal Tower (still right outside our window) isn't one of the 20 tallest buildings in the country. Figures show that the Empire State bldg. is 1248 feet high, the Chrysler 1046, the 60 Wall Tower 950, the RCA 850, Bank of Manhattan 838 and Woolworth bldg. 792—all in New York, the six tallest buildings in America. The seventh tallest in the country is the Terminal Tower—708 feet, all of which should elicit a storm of protest, as every time a superlative is used in STEEL mobs write in with figures purported to show something else is really the superlativest.

Economic Hangover

■ R. R. Shirley of Shirley Mfg. Co., Rockford, Ill., tells of an unnamed lecturer who just recently was discussing present business conditions. The lecturer took a large sheet of white paper and drew thereon three black dots. Thus:



He asked his audience what they saw. Their answer was probably what yours is now: "Three black dots." "Anything else?" asked the lecturer, "No!" everyone insisted. The speaker then chided them for seeing only the black spots, when behind them was a beautiful white paper background many times larger than the small black dots. That, according to the lecturer, is our greatest fault and setback for recovery—the fact that we seek out only the black spots and point them out to others.

So if you see spots before your eyes, just be quiet and maybe no one will notice 'em.

—SHRDLU

tion projects lifting demand for heating and plumbing needs in the near future. Wrought pipe inquiry includes 10,000 feet, 1½-inch, galvanized, for Camp Devens, Mass.; bids in.

Cleveland—Demand for cast and steel pipe is still limited to miscellaneous requirements out of jobber stocks. However, some sellers feel that March should show a moderate improvement over February as the more open weather facilitates laying of pipe for water distribution systems. Prices remain firm.

New York—Purchase of 300 tons by a gas company, Brooklyn, is the first by a utility in recent weeks, cast pipe demand for such lines being sub-normal. For delivery at Trenton, N. J., 245 tons, 30-inch, has also been bought by the procurement officer, Newark. Although several small projects are expected out soon in Westchester county, New York, inquiry lags for this season and buying is mostly in small fill-in lots. Considerable volume is delayed pending financing.

Birmingham, Ala.—Pipe plants continue at about 40 per cent and orders remain spotty. Inquiries thus far have brought no materially large orders.

San Francisco—Demand for cast iron pipe is holding up well and awards last week totaled 1966 tons. This brought the year's aggregate to 6459 tons, compared with 5357 tons for the same period last year. For the second time in many months French interests secured a sizable tonnage for the South Willamette water district in Oregon, 127 tons of 4 to 8-inch pipe.

Seattle—Demand for pipe and accessories is expanding as federal funds become available. Several sizable projects are either up for figures or planned for bids in the near future. Seattle has approved a $13,000 extension, bids soon.

Cast Pipe Placed

928 tons, 4 to 12-inch, Oakland, Calif.; 911 tons, 6 and 8-inch, Los Angeles; 450 tons to American Cast Iron Pipe Co., Birmingham, Ala., and 461 tons to National Cast Iron Pipe Co., Birmingham, Ala.

618 tons to United States Pipe & Foundry Co., Burlington, N. J., and 310 tons to American Cast Iron Pipe Co., Birmingham, Ala.

200 tons, Madison, Wis., to United States Pipe & Foundry Co., Burlington, N. J.

127 tons, 4 to 8-inch, South Willamette water district, Eugene, Oreg., to French interests.

Cast Pipe Pending

1000 tons, Pontiac, Mich.; bids taken.

1685 tons, 36-inch, (7490 linear feet) water main, Washington; bids March 22, contractor's letting.

800 tons, 8 and 12-inch, Washington; Florence Pipe Foundry & Machine

Co., Florence, N. J., low, bids March 7. Levering Bros., Washington, low on 80½ tons of water pipe specials.
423 tons and accessories, for Monroe, Wash.; bids in late March.
375 tons, 4 to 8-inch and fittings, for Lowell, Wash.; bids in.
250 tons, 4-inch, Class 400 and 16-inch Class 250, Los Angeles, specification 2561; bids opened.
196 tons, 3 to 6-inch, Collins water district, Multnomah county, Oreg. second hand steel pipe purchased.
185 tons, 6-inch with fittings, state procurement officer, treasury department, Newark, N. J.; bids March 15.

Steel Pipe Placed

100 tons or more transite, for Milton, Wash., to Pacific Water Works Supply Co., Seattle.

Steel Pipe Pending

Unstated tonnage, 12,000 feet 3 to 6-inch for West Slope district, Portland, Oreg.

Wire

Wire Prices, Page 77

Cleveland—Specifications for manufacturing wire and merchant wire products are unchanged at the generally low level held through February. In a few instances jobbers have re-entered the market for certain items, but miscellaneous consumers continue to order for only actual requirements and for prompt delivery.

Chicago—Shipments of merchant wire products continue to improve slowly. Distributors' stocks are being expanded less than usual but some quickening in deliveries may result before application of higher freight rates to some points. Demand for manufacturers' wire shows only small changes, but most gains are for the better despite absence of gains in automotive needs.

Boston—Better inquiry for highway fencing and cable, with several purchases of electrical goods by the government, part of the business going to New England mills, are about the only new developments in wire.

New York—What slight change developing in wire buying has been upward with manufacturer's wire demand mildly improved. Gains, however, have been small and some producers have experienced no gain, incoming volume being in limited lots for prompt delivery. Demand is well diversified with no advance covering.

Semifinished

Semifinished Prices, Page 77

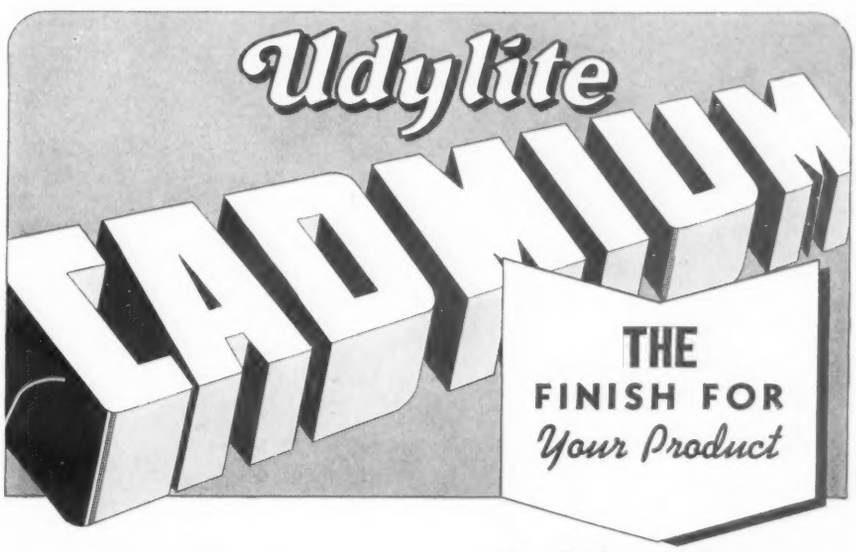
The past week has seen a slight drop in semifinished production after three weeks in which the rate rose constantly. This is interpreted not as a downward trend but merely as a continuation of the leveling-off process which has been going on for some time. Sales of semifinished steel products are still scattered and quite light, and producers expect this fluctuating production to continue for an indefinite period.

Rails, Cars

Track Material Prices, Page 77

Steelmakers look for a large relative increase over the next few weeks in rail and accessory buying than in the purchase of rolling stock. This opinion is based primarily on the assumption that time is drawing near, when those that have held up on rail buying, should begin to show interest so that laying can begin with the advent of favorable weather. The New York Central may be among the first to enter the market as this carrier not infrequently does buy around this time. According to trade reports, the New York Central requirements may involve 20,000 to 35,000 tons.

Chicago, Rock Island & Pacific has placed 10,000 tons of rails with two Chicago producers. The Erie has

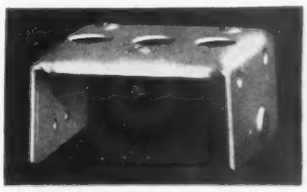


UDYLITE-CADMIUM is the trade name for pure metallic cadmium coatings applied to a very wide variety of metal products. The metal is applied by the Udylite Process, the simplest, most efficient method of cadmium plating known. Udylite-Cadmium is used where the combination of efficient corrosive protection and attractive appearance is desired at low cost.

Regardless of what finish you are using, investigate the possibilities of Udylite-Cadmium applied to your product. We will gladly plate any samples you send to us. ***The Udylite Company,*** 1651 E. Grand Blvd., ***Detroit, Michigan—New York,*** 30 E. 42nd Street; ***Chicago,*** 1943 Walnut Street; ***Cleveland,*** 3756 Carnegie Avenue; ***San Francisco,*** 114 Sansome Street.

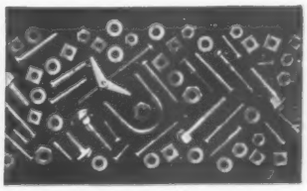
No Other **Finish Offers ALL These Advantages**

Rust Protection—Udylite-Cadmium is recognized as one of the best protective coatings available. **Beauty**—Udylite-Cadmium has an attractive, silvery-white lustre which is definitely appealing to the eye. It has a high tarnish resistance. **Economy**—Udylite-Cadmium coatings are not expensive because their application requires no polishing, buffing or coloring operations . . . because the coatings are easily and simply applied by the Udylite Process. **Easy to Solder**—Udylite-Cadmium coatings find a wide application because they solder easily with non-corrosive fluxes. **Broad Application**—Udylite-Cadmium may be applied to steel stampings, screw machine parts, forgings, castings; grey and malleable iron castings; and many non-ferrous metals without difficulty



Udylite-Cadmium plated radio condenser chassis. Manufacturers of stamped steel parts prefer Udylite-Cadmium because of its rust protective properties, appearance and low cost.

This small casting is Udylite-Cadmium plated. The high covering power and the ease of application make it the ideal protective coating for castings.



Bolts, nuts, washers, fittings receive efficient protection against rust with Udylite-Cadmium. The coating is deposited uniformly on the threaded surfaces permitting positive operation.

scheduled purchase of 15,000 to 20,000 tons of rails when court permission is granted.

Bangor & Aroostook has awarded 665 cars, which is 15 more than its inquiry called for. This removes the only important car inquiry before the market.

Colorado Fuel & Iron Corp. started its rail mill at Pueblo, Colo., last week on a single-turn five-day week. It will roll a small tonnage of 131-pound rails, the heaviest section ever made in this mill, followed by a run of 112-pound rail.

Tacoma, Wash., has purchased six passenger buses from the White Motor Co., Cleveland. G. R. Williams, purchasing agent Oregon Electric Railway Co., Portland, Oreg., will receive bids March 24 for furnishing 22 second-hand box cars of 80,000 pounds capacity.

Car Orders Placed

Bangor & Aroostook, 665 cars, 500 box cars going to the Magor Car Corp., New York; 115 hopper cars to the Bethlehem Steel Co., Bethlehem, Pa.; 50 rack cars to the Greenville Steel Car Co., Greenville, Pa.; 15 more hopper cars were bought than originally inquired for.

Rail Orders Placed

Chicago, Rock Island & Pacific, 10,000 tons to Carnegie-Illinois Steel Corp., Chicago 5000 tons to Inland Steel Co., Chicago.

Shapes

Structural Shape Prices, Page 76

New York—Structural steel inquiry mounts gradually with new tonnage, mostly for public work, coming out in excess of awarded contracts. Included among such estimates are 2500 tons for a bridge, Canal street, New York, closing March 23, and a west side elevated highway project. Private building construction, notably of an industrial type, is lagging behind that of the last two years. Plain material under the new freight rate will advance slightly to fabricators in the New York district.

Chicago—Structural inquiries are heavier, with small jobs accounting for about one third of the 25,000 tons of new work. Highway bridge inquiries include 2369 tons at Fort Worth, Tex., and 2000 tons at Davidson, Okla. Early closing on 3650 tons for the Dodge street bridge, Omaha, Nebr., is anticipated.

Cleveland—Inquiries and awards are few, with public work predominating. Considerable tonnage for private expansion programs on which plans are already prepared has failed to appear, waiting for a more favorable business outlook. Mill prices are firm, and little change is noted on quotations for fabricated material.

Boston—New structural steel inquiry comes out slowly, private construction being sluggish, with about 5000 tons active in the New England territory, including numerous small public work projects. Bids are in on a 1000-ton bridge, Ashland-Bridgewater, N. H., 800 tons of structural steel. Awards are confined to small tonnages, 325 tons for state hospital buildings, Grafton, Mass., being included. This contract went to the Holyoke, Mass., shop while a Hartford, Conn., shop booked 425 tons for hospital buildings, that state.

Philadelphia—Pennsylvania state authority will take bids March 29 on contract 10, building Penn state college. This is one of the few remaining important projects on the state program. Considerable tonnage remains to be bought on jobs for which general contracts already have been let. Several private jobs remain before the trade, most recent of which is the Harrisburg apartment building, taking 600 tons. Prices are still soft on fabricated material.

San Francisco—The largest structural award of the year has just been placed with Bethlehem Steel Co. and involves approximately 6000 tons for trestle extension work at the Grand Coulee dam in Washington. Vierling Steel Co. booked 400 tons for a plant at Nyssa, Oreg., for the Amalgamated Sugar Co. Caissons for drydock No. 3, Mare Island, Calif., requiring 400 tons, on which Moore Drydock Co., Oakland, Calif., were low, will be constructed by the government and bids for the material will be issued at a later date.

Shape Contracts Placed

6000 tons, trestle addition, Grand Coulee

Shape Awards Compared

	Tons
Week ended March 12	20,949
Week ended March 5	9,403
Week ended Feb. 26	8,409
This week, 1937	35,780
Weekly average, year, 1937	16,060
Weekly average, 1938	13,758
Weekly average, February	10,059
Total to date, 1937	300,270
Total to date, 1938	151,335

Includes awards of 100 tons or more.

dam, Washington, to Bethlehem Steel Co., San Francisco.

3000 tons, du Pont buildings, Baton Rouge, La., to Virginia Bridge Co., Roanoke, Va.

1875 tons, 41 gate frames, for Coulee dam, to Koppers Corp., Baltimore; previously reported at 1000 tons.

1300 tons, steel sheet piling, cofferdam, navy yard, Norfolk, Va., to Bethlehem Steel Co., Bethlehem, Pa.; McLean Contracting Co., Baltimore, general contractor.

1100 tons, including plates, Possum Kingdom dam, Brazos river, near Mineral Wells, Tex., to Omaha Steel Works, Omaha, Neb., 725 tons, and Pittsburgh-Des Moines Steel Co., Des Moines, 375 tons; bids Feb. 24.

975 tons, sanitarium, Mont Alto, Pa., to Fort Pitt Bridge Works, Pittsburgh.

600 tons, addition, state prison, Auburn, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

545 tons, Bellpoint bridge No. 1385 Hinton, W. Va., for state, to Bethlehem Steel Corp., Bethlehem, Pa.

485 tons, state teachers college, Indiana, Pa. to Fort Pitt Bridge Works, Pittsburgh.

425 tons, state hospital buildings, Newington, Conn., to Standard Structural Steel Co., Hartford, Conn.; Allyn Wadhams Co., Hartford, Conn., general contractor.

400 tons, plant, Amalgamated Sugar Co., Nyssa, Oreg., to Vierling Steel Co., Chicago.

350 tons, part 2, state hospital, Allentown, Pa., to Bethlehem Contracting Co., Bethlehem, Pa.

340 tons, Littauer public administration school building, Harvard University, Cambridge, Mass.; The Aberthaw Co., Boston, general contractor. Concrete Steel Co., Boston, booked 310 tons of reinforcing bars for this project, reported as 275 tons last week.

330 tons, bulkheads, Grand Coulee dam, Odair, Wash., to Mississippi Valley Structural Steel Co., St. Louis.

325 tons, dormitory and service building, state hospital, Grafton, Mass., to Haarmann Steel Co., Holyoke, Mass.; Rugo Construction Co., Boston, general contractor, Northern Steel Co., Boston, awarded reinforcing steel.

300 tons, bridge contracts 1600 and 1609, Martinsville and Tobinsport, Ind., to Central States Bridge & Structural Co., Indianapolis.

275 tons, part 2, Laurelton State Village, Pa., to Reading Steel Products Co., Reading, Pa.

270 tons, A-frame crest dam, No. 1, Tombigbee river, Alabama, to Virginia Bridge & Iron Co., Roanoke, Va.

216 tons, dope room and foundry building, Tonawanda, N. Y., to R. C. Mahon Co., Detroit.

205 tons, state school, Scranton, Pa., to Pine Brook Iron Works, Pine Forge, Pa.

200 tons, addition to Hart department store, San Jose, Calif., to Hellwig's Iron Works, San Jose.

200 tons, fiber pilot plant, Newbridge, Del., for E. I. du Pont de Nemours & Co., to Belmont Iron Works, Philadelphia.

195 tons, state teachers college, West Chester, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.

195 tons, state hospital building, Marlboro, N. J., to Selbach-Meyer Co., West New York, N. J.

190 tons, state teachers' college, Millersville, Pa., to A. B. Rote & Co., Lancaster, Pa.

175 tons, Little Wolf river bridge, Waupaca, Wis., to Midland Structural Steel Co., Cicero, Ill.

175 tons, almshouse, New Lisbon, N. J., to Park Steel & Iron Co., Asbury Park, N. J.

150 tons, bridge LA-7-49, Laurence county, Ohio, to Burger Iron Co., Akron, O.

150 tons, six oil derricks, Termo Co., and Hancock Oil Co., Long Beach, Calif., to unnamed interests.

130 tons, conveyor bridge, Aluminum Ore Co., Mobile, Ala., to Southern Steel Works Co., Birmingham, Ala.

130 tons, bridge, LeFlore, Miss., to Pidgeon-Thomas Iron Co., Memphis, Tenn.

125 tons, five oil derricks, Hancock Oil Co., Los Angeles, to unnamed interest.

111 tons, overpass, 120-foot through truss, Barnet, Vt., to Pan-American Bridge Co., New Castle, Ind.; M. DeGroot, Jericho, Vt., general contractor; bids Feb. 25.

107 tons, shapes and bars, town hall building, Wareham, Mass., to Providence Steel & Iron Co., Providence, R. I. and Truscon Steel Co., Boston; M. S. Kelliher Co., Boston, general contractor.

100 tons, bridge, section 6B, Calhoun county, Hamburg, Ill., to Rock Island Bridge & Iron Works, Rock Island, Ill.

100 tons, packing plant, Carpenteria, Calif., to Western Pipe & Steel Co., Los Angeles.

100 tons, reclamation bureau bridge, Milk river project, Mont., to Joseph T. Ryerson & Sons Co., Chicago.

100 tons, Balch and Chippenhock bridges, Clarendon, Vt., to Pan-American Bridge Co., New Castle, Ind.; through Edward L. Knight, South Royalton, Vt.

Shape Contracts Pending

20,000 tons, Pitt river bridge, Central valley project, Calif.; bids soon by bureau of reclamation.

10,770 tons, shafts and tunnels, West Branch-Kensico tunnel, Delaware aqueduct; bids March 24, board of water supply, New York; work includes shafts 11 and 12 and about 33,400 feet of tunnel, Carmel, Somers, North Salem and Lewisboro, N. Y., contract 322; shafts 13 and 15 with 30,600 feet tunnel, Bedford and Lewisboro, N. Y., contract 323; shafts 15 and 16 with 37,100 feet tunnel, North Castle and Bedford, N. Y., contract 324. Tunnel will be circular with 15-foot diameter within concrete lining. Contract 322 also takes 238 tons, steel sheet piling. Other steel requirements for this work appear under reinforcing contract pending column, this section, STEEL.

6092 tons, dam No. 24 on Mississippi river at Clarksville, Mo., Central Engineering Co., Davenport, Ia. general contractor; includes 3000 sheet piling.

6000 tons, bridge, Southern Pacific Co., over Sacramento river, Redding, Calif., on Central valley project; bids soon.

5000 tons or more, trashracks, outlet pipes and miscellaneous, for Coulee dam, Wash.; bids to reclamation bureau, Denver, March 16.

3640 tons, bridge over Missouri river, Dodge street, Omaha, Neb.; Minneapolis Bridge Co. Minneapolis, Minn., low on divisions A and C which include 2790 tons of structural steel and 200 tons of wire cable strand, the latter not included in above tonnage, bids March 3, Robinson & Steinman, New York consulting engineers. George

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W. Condon Co. and Peter Kiewit Sons Co., Omaha, joint bidders, low on division B; Inland Construction Co. and Empire Construction Co., Omaha, joint bidders, low on division D; bids March 3. A and C include main bridge superstructure and east viaduct; B viaduct substructure, and D west viaduct superstructure.

2500 tons, surgical building, Massachusetts general hospital, Boston; all bids rejected, project to be refigured.

2500 tons, bridge, West and Marginal streets, across Canal street, Manhattan, N. Y., west side elevated highway project; bids March 23, president, Borough of Manhattan.

2369 tons, highway bridge, Ft. Worth, Tex.

2000 tons, highway bridge, Davidson, Okla.

1800 tons, bridge, Southern Pacific Co., over Sacramento river, Antler, Calif., on Central Valley project; bids soon.

1700 tons, New York state building, world's fair; Psaty & Fuhrman Inc., New York, low on superstructure; also includes 300 tons in substructure on which Young-Fehlhaver Pile Co., New York, are low.

1650 tons, bridge Southern Pacific Co., over Salt Creek, Pollock, Calif., on Central valley project; bids soon.

1575 tons, including H-piling and machinery, interstate bridge, Snake river, Washington-Idaho; Puget Construction Co., Seattle, general contractor at $748,337.

1250 tons, bridge for Southern Pacific Co., over O'Brian Creek, Elmore, Calif., Central valley project; bids soon.

1150 tons, Big Eddy bridge over Columbia river, The Dalles, Oreg., for Dalles Bridge Co.

1000 tons, highway bridge, Spearfish, Wash.

1000 tons, building, S. H. Kress Co., San Antonio, Tex.

850 tons, bridge, Southern Pacific Co., over Doney Creek, Pollock, Calif., Central valley project; bids soon.

800 tons, hangars, Bolling field, Washington; Virginia Engineering Co., Newport News, Va., awarded contract at $447,750, bids Feb. 24.

800 tons, bridge, Ashland-Bridgewater, N. H.; Lane Construction Co., Meriden, Conn., low, bids March 9. Project also takes 100 tons for floor and 100 tons, reinforcing steel; 20 contractors bid job.

750 tons, delta crossing over Sacramento river, Southern Pacific Co., Central valley project, Calif. bids soon.

725 tons, manufacturing plant building, Norton Company, Worcester, Mass.

600 tons, addition to Mercy hospital, Pittsburgh, for Sisters of Mercy.

600 tons, oven coal bin, conveyor and quenching station, Ford Motor Co., Dearborn, Mich.

600 tons, Park Plaza apartments, Twenty-fourth and Market, Harrisburg, Pa.; bids due March 16.

497 tons, shop buildings Western Pacific Co., Sacramento, Calif.; bids opened.

400 tons, addition, school 139, Manhattan, N. Y.; bids on steel direct, fabricating and erecting, March 17, board of education, New York.

400 tons, caissons for drydock No. 3, Mare Island, Calif.; Moore Drydock Co., Oakland, Calif., low but navy department will do work.

375 tons, school, Kutztown, Pa.; bids in.

300 tons, highway bridge, Washington, Kans.

300 tons, central school, Romulus, N. Y.; bids March 18.

300 tons, state college building, Slippery Rock, Pa.

290 tons, steel sheet piling, sewers, 130th street, Queens, N. Y.; Charles Bennett Improvement Co. Inc., Brooklyn, low bids March 7.

265 tons, office building, Schiavone-Bonomo Corp., scrap dealers, New York, at Jersey City, N. J.

260 tons, school, Bala-Cynwyd, Pa.; Barclay White & Co., Philadelphia, general contractor.

250 tons, administration building, Buffalo airport; bids March 24.

225 tons, bridge, Southern Pacific Co., Delta crossing of Sacramento river, Pollock, Calif., on Central valley project; bids soon.

210 tons, magnesium foundry, for Bohn Aluminum & Brass Corp., Adrian, Mich.

200 tons, alterations, store, Bonwit-Teller Co., New York.

200 tons, state overpass FAS-397-B, South Fork, Colo.

200 tons, Kress Store building, San Pedro, Calif.; bids opened in New York.

175 tons, store building, for E. Mithoff Nicholas, Columbus, O.

175 tons, bridge, Greenwood, Wis.

170 tons, highway work, Rio Grande county, Colorado; bids opened.

167 tons, over-crossing, near Walsenburg, Huerfana county, Colorado; bids opened.

150 tons, service station, for International Harvester Co., Omaha, Nebr.

145 tons, bridge 86.3 and 87.4, Guntersville, Ala., for Tennessee Valley Authority.

138 tons, crossing near Keystone, White Pine county, Nev.; bids opened.

130 tons, building, state school, Wassaic, N. Y.

128 tons, bus structures, Boulder dam, Nev., specification 1036-D; bids opened.

125 tons, railroad bridge, specification 1045-D, Charleston, Utah, for bureau of reclamation.

125 tons, service building, Philadelphia, for Atlantic Refining Co.

100 tons, war department bridge, Hood river, Oreg.; Frank Watts Construction Co., Portland, general contractor.

Unstated, ten 131-foot steel towers for Burley, Ida., and Great Falls, Mont.; bids of department of commerce, Washington, March 14.

Reinforcing

Reinforcing Bar Prices, Page 77

New York—That distributors of reinforcing steel bars are making a strong effort to stabilize prices at 2.84c, delivered job, for cut lengths is evident by stubborn refusal of contractor-buyers to close on considerable tonnage, some of which has been estimated for weeks. Shading has not disappeared entirely, but most sellers are resisting pressure better than usual. As a result active tonnage is heavy, about 2500 tons of new work appearing, including 785 tons for water tunnels and shafts, Putnam and Westchester counties, readvertised for March 23 closing.

Pittsburgh—Releases on previous business are still holding up fairly well, but little new business has appeared and the outlook seems dull

at the moment. A break in the weather would undoubtedly speed action on some contemplated projects. Prices are holding firm.

Cleveland—Requirements for reinforcing bars remain almost at a standstill. Recent specifications are limited to small tonnages, and inquiries have failed to improve. There has been no real price test in a number of weeks. City of Cleveland will advertise soon for considerable tonnage of reinforcing bars for piers and abutments of the new Main street bridge, Cleveland.

Chicago — Activity has improved moderately, with further gains in private building expected with the approach of spring. Jobs taking less than 100 tons are fairly numerous, while several larger orders are pending. The state highway department has placed a number of small orders against a recent letting.

Boston—Additional highway reinforcing requirements include 175 tons for Glocester, R. I., closing March 21, road and bridge work now pending and partly estimated being close to 900 tons. This is the first Rhode Island highway inquiry in months. Building needs are mostly confined to public works, awards involving several hundred tons, Grafton, Mass., state hospital project and Rochester, N. H., Spaulding high school being included. Both went to a Boston district mill.

Philadelphia — Fabricators are fairly well booked ahead for the next several weeks as a result of the Pennsylvania institutional program, for which a number of projects remain pending. Prices are regarded considerably firmer since fabricators are not competing so keenly for business. Slight increase in private work is developing with the appearance of better weather.

San Francisco—Little new reinforcing bar business has developed. Unnamed interests secured 300 tons for an immigration station at San Pedro, Calif. Bids have just been taken on 237 tons for a high school at El Cerrito, Calif., and on 235 tons for barracks at Yountville, Calif. Awards totaled 1216 tons and brought the total for the year to 20,477 tons, compared with 15,778 tons a year ago.

Concrete Bars Compared

	Tons
Week ended March 12	**4,288**
Week ended March 5	**2,640**
Week ended Feb. 26	**4,410**
This week, 1937	**4,997**
Weekly average, year, 1937	**6,266**
Weekly average, 1938	**5,178**
Weekly average, February	**5,208**
Total to date, 1937	**43,057**
Total to date, 1938	**56,963**

Includes awards of 100 tons or more.

Reinforcing Steel Awards

370 tons, bridge, 140th street and Grand Concourse, New York, to unnamed interest; through Garafano Construction Co. Inc., Mt. Vernon, N. Y.

370 tons, northerly unit, Flushing river bridge, New York, to Bethlehem Steel Co., Bethlehem, Pa.; through L. P. O'Connor Inc., New York.

320 tons, State office building, Jefferson City, Mo., to Ceco Steel Works, Kansas City.

300 tons, immigration station, San Pedro, Calif., to unnamed interest.

280 tons, school, Bala-Cynwyd, Pa., to Truscon Steel Co., Youngstown, O.

275 tons, state hospital for the insane, Norristown, Pa., to Sweet's Steel Co., Williamsport, Pa.

259 tons, highway work, Chaffee county, Colorado, to unnamed interest.

225 tons, state teachers college, West Chester, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

187 tons, junior department home economics and dormitory building, Springfield, Ill., reported placed with Vredenburg Lumber Co., Springfield.

182 tons, bridges, Los Angeles county, California, for state, to unnamed interests.

180 tons, state teachers college, Pennhurst, Pa., to American Steel Engineering Co., Philadelphia.

170 tons, hydroelectric plant, Merrill, Wis., to Cook & Brown, Oshkosh, Wis.

150 tons, bridge, route 128, Washington county, Illinois, to Laclede Steel Co., St. Louis.

150 tons, apartment building, Eastern Construction Co., Washington, to Youngstown Sheet & Tube Co., Youngstown, O.

150 tons, state hospital, Danville, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

120 tons, Englewood post office, Chicago, to Calumet Steel Co.

100 tons, building, National Cash Register Co., Washington, to Rosslyn Steel & Cement Co., Washington.

100 tons, state teachers college, Lock Haven, Pa., to Truscon Steel Co., Youngstown, O.

100 tons, fire station, San Antonio, Tex., to Brandt Iron Works, San Antonio.

100 tons, church, 10801 Wilshire boulevard, Los Angeles, to unnamed interest.

100 tons, addition to St. Katherine school, Burlingame, Calif., to Herrick Iron Works, Oakland, Calif.

100 tons, building, St. Joseph college, Adrian, Mich.

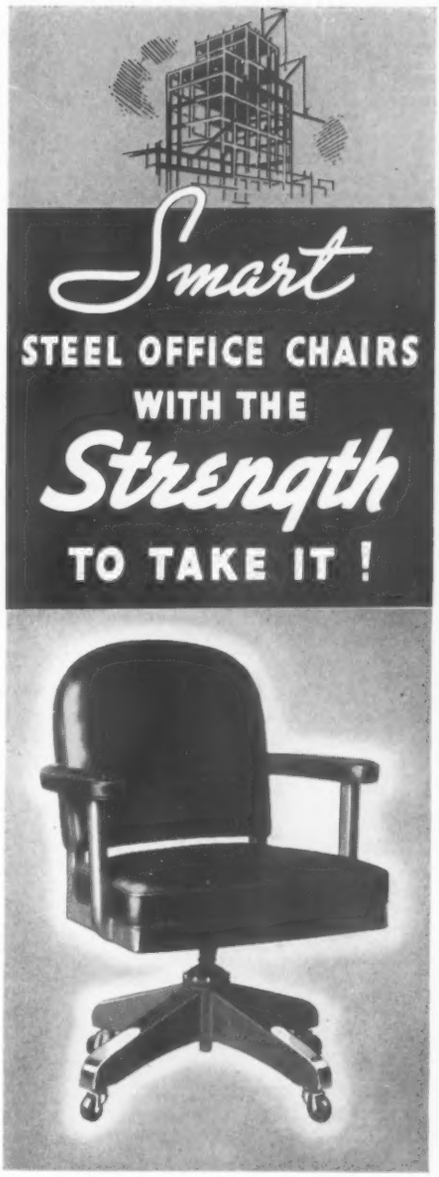
Reinforcing Steel Pending

1400 tons, tuberculosis sanitorium, Mt. Alto, Pa.

810 tons, New Jersey approach, Paterson Plank road, North Bergen to Bergenline avenue, Union City, N. J., Lincoln tunnel bids March 29, Port of New York authority, contract MHT-72.

785 tons, shafts and tunnels, West Branch-Kensico section, Delaware aqueduct, Putnam and Westchester counties, New York; bids March 24, board of water supply, New York; three contracts 322, 323 and 324. Work also takes 95,000 linear feet, steel pipe for grouting, up to 2½-inch diameter, and 45,000 pounds, grating, ladders and steel stairs.

710 tons, bridge over Missouri river, Dodge street, Omaha,, to be let under four contracts; division A, 344 tons, division B, 100 tons, division C, 100 tons, and division D, 165 tons. See



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structurals pending, Steel, this issue, for low bidders.

700 tons, Interstate bridge, Snake river, Washington-Idaho, Puget Construction Co., Seattle, general contractor at $748,337.

635 tons, outlet structures, Sardie dam, U. S. engineer, Vicksburg, Miss.; bids April 19. Work also requires 550 tons, steel piling and steel bearing piles, and 100 tons of structural steel, pipe and miscellaneous metal work.

575 tons, sewers, 130th street, Queens, N. Y.; Charles Bennett Improvement Co. Inc., Brooklyn, low, bids March 7.

565 tons, dam No. 24, on Mississippi river at Clarksville, Mo., Central Engineering Co., Davenport, Ia., general contractor.

400 tons, immigration, customs building and plaza, Port Huron, Mich.

365 tons, six bridges Fairfield and Westport, Conn., general contracts awarded Mariani Construction Co., New Haven, (two), Peter Michell, Inc., Greenwich, Conn. (two), Paul Bacco, Stamford, Conn., and Edward E. Bray Co., Bridgeport, Conn., (one each).

350 tons, mesh, highway project, Nassau county, New York; bids March 15, department of highways, Albany, N. Y.

300 tons, viaduct sub-structure, Ogden avenue, Chicago.

289 tons, paint and oil storage warehouse, Mare Island, Calif.; general contract to De Lucca & Son, Inc., San Francisco.

280 tons, auxiliary state prison, Jefferson City, Mo., Childers Construction Co., Kansas City, general contract.

250 tons, highway project RC 3931, Burnt Hills cutoff, Ballston, Saratoga county, New York; A. I. Savin Construction Co., Hartford, Conn., contractor at $248,027.25; bids March 8.

237 tons, high school, El Cerrito, Calif.; bids opened.

235 tons, barracks at Yountville, Calif.; bids opened.

220 tons, state hospital, Danville, Pa.

175 tons, highway project, Glocester, R. I., to Connecticut state line; bids March 21, Providence, R. I.

120 tons, teachers college, Millersville, Pa.

115 tons, highway work, in Pima and in Graham county, Arizona; bids March 18.

113 tons, assembly and dairy products building, state fair grounds, Sacramento, Calif.; bids opened.

110 tons, central school, Romulus, N. Y. bids March 24.

105 tons, post office, Northampton, Mass.; bids March 24.

103 tons, highway work in San Diego county, California, for state; bids March 17.

100 tons, St. Phillips parochial school, San Francisco; general contract to Barrett & Hilp., San Francisco.

100 tons, building, Frank Tea & Spice Co., Cincinnati, O.

100 tons, Illinois state procurement office, Chicago; Calumet Steel Co., Chicago, low.

Pig Iron

Pig Iron Prices, Pags 78

New York—New freight rate schedules will result in a slightly higher delivered price at Brooklyn, with No. 2 foundry holding at $27.50 as against the present price of $27.47 and malleable at $28, as against $27.97. Slight increases also will be made in the rates to certain upstate points and, in fact, to a few consuming plants in Northern New Jersey. However, at all major points in the Northern New Jersey metropolitan district, prices will remain unchanged inasmuch as the rates fall in the short haul classification (under a 20 cent per ton maximum) and were advanced last November.

In other words, the new rates, insofar as they apply to the above mentioned points, taking an increase, are based on the rates prevailing prior to last November, with the new advance amounting to 10 per cent.

To simplify rates where they run into fractions the same rule will apply that prevailed last fall, namely, that rates figured in cents per ton 0.49 and less could be eliminated, with 0.50 and up taking the full cent. Buying continues dull.

Cleveland — Pig iron producers note little improvement in average operations of foundries. Buying continues on a hand-to-mouth basis and for prompt delivery. Some sellers confidently expect shipments to increase about 10 per cent during March. Prices are firm.

Chicago—Pig iron shipments are ahead of the rate a month ago, and with the longer month, March will show a moderate gain over February. Consumption has improved only slightly, but depleted inventories of foundries in a number of cases necessitate taking additional iron. Improvement in production of automotive castings is expected during the next several weeks, and farm equipment foundries are expected to hold schedules around recent levels.

Boston — What moderate increase in pig iron buying has developed has been in small scattered lots, although sellers in most instances note a slight gain in the number of such orders. There has not been any material change, however, in foundry melt and some suppliers of castings to machine tool builders are less active than several weeks ago. As most iron consumed in this territory is based on fairly short hauls, not much change in delivered prices will follow the freight rate increase, although there are a few points where the advance will be a mild factor in costs.

Philadelphia—The navy department will take bids March 22 on 250 tons of low phosphorus iron for delivery to the Washington navy yard, supplementing recent acquisitions. Business locally continues of a carlot character with no consumers showing interest in future requirements. Smaller foundries are operating on a hand-to-mouth basis while larger interests are still comfortably stocked. Prices are firm.

Buffalo—Failure of pig iron buying to expand beyond the hand-to-mouth character, which has prevailed since the first of the year, necessitated the banking of one blast furnace by the Hanna Furnace Corp. Shipments are about even with February but producers, in hopes of a gain in orders, have been forced to pile iron. Consumers are still restricting orders to small quantities for nearby consumption.

Cincinnati—Specifications for pig iron show an increasing number of melters who have exhausted inventories. As a general rule they

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are asking rush shipments for immediate needs only. Third quarter contracting is slow as foundries, on average schedules of 25 per cent, fail to define future castings demand. Melters on machine tool castings continue district leadership, despite some tapering.

St. Louis — Pig iron demand is somewhat better. A number of users for a considerable while have been working off inventories, and have reached the stage where they must take on tonnage to support even their low rate of activities.

Birmingham, Ala. — Slight improvement continues in pig iron, with operations of 13 blast furnaces maintained following the lighting of two additional units the latter part of February by the Tennessee Coal, Iron & Railroad Co.

Toronto, Ont. — New business gradually is improving in the iron and steel industry with the rolling stock equipment producers receiving the bulk of new awards. Announcement now is made that the Canadian Pacific is arranging to place an order with the Canadian Locomotive Co., Kingston, Ont., for 15 Pacific type locomotives. Foundry operations also are gaining resulting in increased demand for merchant pig iron.

Scrap

Scrap Prices, Page 80

Chicago—Heavy melting steel is up 25 cents on a sale at $12.50, representing an increase of 50 cents a ton over the low for the year to date. Light supplies, rather than active customer buying, account for the stronger market. Railroad lists of heavy melting steel lately have brought better than $13, while broker-dealer trading generally is bringing $12.50. Several other grades also are higher in sympathy with the stronger tone in heavy melting steel, but consumer buying continues light.

Pittsburgh—The scrap market continues to show the lethargy which has been its most important characteristic for several weeks. Mill stocks are larger and there is no definite indication at present as to when buying will be resumed in quantity. Some small sales have been made, all completely within the price bracket now quoted, although it is expected, in view of the weakened export position, railroad specialties will sell lower in the lists now pending.

Cleveland—A few carloads of No. 1 heavy melting steel and pressed sheets have been bought by a Youngstown district steelmaker at a concession of about 25 cents, indicates the small-lot business in scrap being transacted in this area. Some shipments are being made from time to time from Cleveland yards, largely blast furnace material.

Detroit — With a local steelmaker making the first purchase of scrap in three months, the market has been established on a firmer basis. This, coupled with additional firmness in cast grades, brightens the outlook perceptibly.

The above mentioned sales of borings and turnings involved only a small tonnage and went at a lower price than has been current, but now that a definite market has been established the air is cleared.

Scrap supplies from automotive plants are heavier, both Fisher Body and Chrysler reporting increased tonnages available for sale.

Bundles and loose clips are off another 50 cents, forge flashings $1, with heavy breakable cast up 50 cents.

New York—With domestic buying of scrap at a standstill, dullness is emphasized by a slowing down in buying for export, most old orders having been shipped or covered.

Philadelphia—A slight fillup has developed in heavy melting steel as a result of a scramble on the part of some dealers to cover against immediate export requirements for export. As a result one broker has advanced buying prices on No. 1 heavy steel for domestic mill delivery 50 cents to $14.50 and No. 2 to $12.50. This situation is not expected to continue as cartel orders will be well completed by the end of March. A cargo cleared for Japan Friday and at least three additional are scheduled before March 20 for Japan. Domestic mills are placing no new commitments and some are holding up releases. Prices are unchanged with the exception of steel axles, which are scarce and are quoted at $21.50 to $22.50.

Boston — Well covered against cargo requirements just ahead, brokers are not actively buying heavy melting steel for export at lower prices, $13.50, dock, for No. 1 heavy melting with No. 2 one dollar less. There is no demand for Pennsylvania shipment, with prices inclined to be easy; also for district delivery.

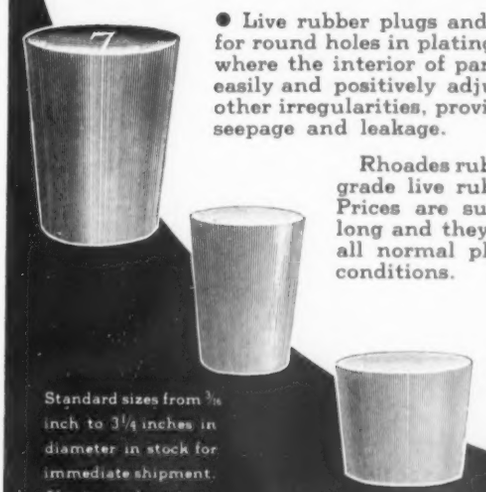
Buffalo—Weakness in iron and steel scrap was augmented during the past week as the leading mill of the district withdrew its $13 a ton bid for No. 1 heavy melting steel.

This left price ranges purely nominal, except for a few small sales among dealers. Indications were that the range of $12.50 to $13 a ton for No. 1 steel would be lowered as rumors persisted that a sale was consummated at $12.50 a ton.

St. Louis—From the viewpoint of purchasing by melters the market for iron and steel scrap is virtually at a standstill, and the near-by outlook holds few indications of a change for the better.

Seattle—Shipments to the Orient are increasing, Dulien Steel Products Inc. have chartered three full cargo vessels, one to load 11,000 tons for

PLUG YOUR LOSSES



● Live rubber plugs and stoppers are the ideal closure for round holes in plating, finishing and other processes where the interior of parts must be protected. They easily and positively adjust themselves to threads and other irregularities, providing complete protection from seepage and leakage.

Rhoades rubber plugs are made of the best grade live rubber and are sized accurately. Prices are surprisingly low. Their life is long and they can be used repeatedly under all normal plating, finishing and shipping conditions.

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Standard sizes from 3/16 inch to 3¼ inches in diameter in stock for immediate shipment. Also in stock, a complete line of laboratory stoppers.

R. W. RHOADES METALINE CO., INC.

50-3rd Street Long Island City, N. Y.

Japan this month. Reports from Japan indicate that import regulations for metals will be eased, in line with improved credits.

Toronto, Ont.—General conditions in scrap show little change. Demand is specialized and sales mostly are in small lots. Mills in the Hamilton area continue to take heavy melting steel and turnings as offered by dealers, but shipments are below the average of last year.

Warehouse

Warehouse Prices, Page 79

New York—Warehouse volume is ahead of the corresponding period last month with orders slightly more numerous and individual shipments tending heavier. Buying is well distributed as to products with alloys and especially lines making the best improvement. Prices are fairly well maintained with scattered shading confined to the usual offenders.

Cleveland—Warehouse stocks are still low on some items despite some fill-in buying reported since prices were announced unchanged for the second quarter. One distributor reports the number of orders received so far this month is about on a par with February, with total tonnage somewhat more. Prices are firm.

Philadelphia—The new 2 per cent sales tax in Philadelphia is proving puzzling to the warehouse trade. It appears that warehouses are not permitted to absorb the tax on steel sold in Philadelphia for direct consumption. The tax, however, is not applicable on steel shipped from nearby warehouses across the state line. Current business is not active but the daily average is reported slightly above that of February. Alloy grades, especially, are moving better.

Chicago — Sales are steady, with a small upturn anticipated during late March. Business still compares favorably with the corresponding period of recent years, with the exception of 1937.

Buffalo—A steadier tone and a minor rise in sales and bookings gave a brighter hue to warehouse business. Some distributors report March shipments moderately above February while others find business about the same.

St. Louis — Warehousemen describe current business as holding about steady as a whole, but with demand for sheets, strip and bars relatively more active than other items. What betterment there has been in the past several weeks is due almost entirely to buying by the general manufacturing trade.

Seattle—Business continues spotty, with no sustained buying, normally expected at this season. Sales are in small lots, only occasional car lots.

Tin Plate

Tin Plate Prices, Page 76

New York—Labor walkouts, which began here a week or so ago, have been confined so far to only a few of the smaller can manufacturing plants. However, the threat of strike still hangs over a number of small concerns in the metropolitan area, with a result that the immediate outlook for tin plate business continues mixed. On the whole, however, specifications are expanding moderately, reflecting some releases to meet requirements of the fish canning season.

Pittsburgh—Tin plate production is holding up fairly well at about 60 per cent. Producers were gratified to learn from the statement of a leading can producer that there has been only a 5 per cent decrease in general line can production, especially in view of heavy inventories now held by most can companies. It is generally felt that if this condition continues, nearly normal business will be seen for the last half of the year.

Steel in Europe

Foreign Steel Prices, Page 79

London — (*By Cable*) — Production of steel ingots and castings in Great Britain in February totaled 1,057,600 tons, a loss of 23,800 tons from January, due to the shorter month. Pig iron output in February was 693,300 tons, 67,800 tons under January. Active stacks at the end of the month were 124, compared with 130 at the end of January.

The market in general is quiet and three blast furnace stacks in the merchant trade have been blown out since the beginning of the year. Demand for steel is irregular but pressure is strong for structural material, with deliveries improving in most districts. Imports of semifinished steel are more than sufficient for the present requirements.

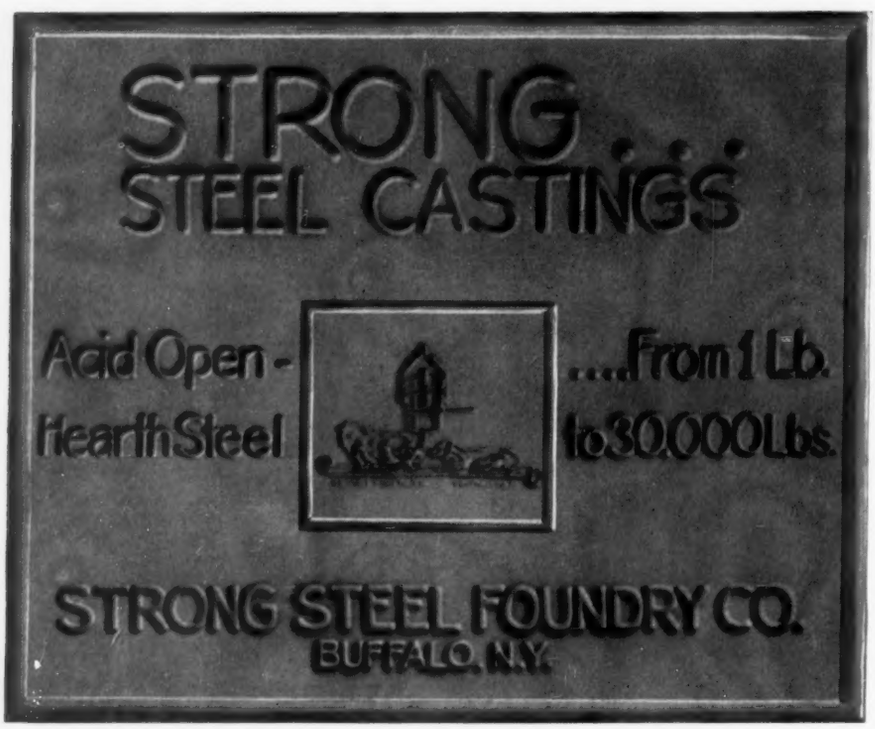
The Continent reports a marked increase in inquiries following the meeting of the cartel when all sellers raised the price of bars. Political uncertainty holds back much pending business.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 77

Business continues slow, and occasional gains noted in specifications have been small. Prospects for improved demand from railroads are less favorable in view of the reaction by the carriers to the rate increase granted last week.

The farm equipment industry continues the best customer, requirements being well maintained and giving indication of remaining at a relatively high level during coming months. Orders from jobbers indicate little change in sales to consumers, and there is no inclination to increase stocks.



Ferroalloys

Ferroalloy Prices, Page 78

New York — Ferromanganese price has been reaffirmed at $102.50, duty paid, seaboard, for second quarter. The recently announced freight rate increase will in all probability result in a Pittsburgh delivered price of $107.77, once the change becomes effective, possibly around the middle of April.

This delivered price compares with the present quotation of $107.49, and represents a 10 per cent increase over the rate of $4.79 between Baltimore and Pittsburgh, which prevailed prior to Nov. 15, last year. The rate now in effect is $4.99.

There, however, may be a temporary delay, pending action by the Pennsylvania state commission, in fact, until this commission does act on intrastate rates it cannot be definitely stated what the new delivered price will be.

Should the Pennsylvania state commission refuse to grant an increase on intrastate rates similar to that just announced on interstate rates, the rate between Philadelphia and Pittsburgh on the present basis of $5.19 would prove more advantageous than the proposed rate of $5.27 between Baltimore and Pittsburgh. However, the Pennsylvania commission, while upon occasion delaying action, is generally expected to follow the lead of the interstate commerce commission, with a result that Baltimore should continue to be the base for shipments into Pittsburgh.

Ferromanganese shipments have shown little improvement so far this month; nevertheless, the trade still anticipates an improvement for the month as a whole. Even should the daily rate fail to improve, although holding its own, March should prove to be a better month by virtue of the fact that it has a greater number of days.

Domestic spiegeleisen, 19 to 21 per cent, is holding at $33, Palmerton, Pa., and 26 to 28 per cent at $39.

Coke By-Products

Coke By-Product Prices, Page 77

New York — Shipments of sulphate of ammonia are heavy, the seasonal demand by the fertilizer trade having developed briskly. While much of this volume is against contracts, an encouraging total of spot buying is also being done at $29.50 a ton. Phenol demand has dropped to a low point with the chemical industries and makers of synthetic resin taking in little material. While some seasonal gain is noted in naphthalene to the jobbing trade, the improvement to date has been limited. Distillates are slow with toluol adversely affected by light buying by lacquermakers.

U. S. Steel's February Shipments Least Since '34

■ Shipments of finished steel by the United States Steel Corp. in February totaled 474,723 tons, a decline of 43,599 tons from the January total of 518,322 tons, due to the shorter month. Shipments were less than half the 1,133,724 tons in February, 1937, and lower than the corresponding month of 1936 and 1935.

This is the lowest monthly total since December, 1934, with 418,630 tons.

U. S. STEEL CORP. SHIPMENTS
(Inter-company shipments not included)
(Tons)

	1938	1937	1936	1935
Jan.	518,322	1,149,918	721,414	534,055
Feb.	474,723	1,133,724	676,315	583,137
Mar.	.....	1,414,399	783,552	668,056
April	.....	1,343,644	979,907	591,728
May	.....	1,304,039	984,097	598,915
June	.....	1,268,550	886,065	578,108
July	.....	1,186,752	950,851	547,794
Aug.	.....	1,107,858	923,703	624,497
Sept.	.....	1,047,962	961,803	614,933
Oct.	.....	792,310	1,007,417	686,741
Nov.	.....	587,241	882,643	681,830
Dec.	.....	489,070	1,067,365	661,515
Y'rly adj.	.....	.....	†40,859	†23,750
Total	.....	12,825,467	10,784,273	7,347,549

†Deduction.

New Package Contest Awards Announced

■ First award in the metal container group of the All-America package competition has been unanimously awarded to Heizbox, an all-metal, hopper-front package for bolts, nuts and related products STEEL, Jan. 10, p. 57). Only recently introduced, it is claimed the new package is directly responsible for more than doubling sales. It was designed and is manufactured by Heiz & Heiz Inc., Brooklyn, N. Y.

To Anaconda Wire & Cable Co., New York, the contest judges voted an award for redesigning its more than 500 wire and cable packages. The new packages, designed for customers' convenience, were selected for visibility, readability, trademark value, simplicity and ease of application. These packages are displayed in showrooms of *Modern Packaging*, sponsors of the competition, 425 Fourth avenue, New York.

Lincoln Welding Medal Award Board Is Named

■ American Welding Society, New York, has appointed a board of awards to select the recipient of the Lincoln gold medal for 1938. The board consists of H. L. Whittemore, bureau of standards, Washington; G. T. Horton, Chicago Bridge & Iron Co., Chicago; A. G. Oehler,

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editor *Railway Electrical Engineer*, New York.

The purpose of the medal is to encourage presentation before the society of papers effective in promoting welding. It is awarded each year to the author or authors of the paper which in the judgment of the board is the greatest original contribution.

Nonferrous Metals

Nonferrous Metal Prices, Page 78

New York—European political developments unsettled all major metal markets abroad last week with prices quoted Friday on the London Metal Exchange reaching new lows for the month. Domestic markets, reflecting also light consumer demand, displayed a weaker undertone with tin and zinc prices decliining.

Copper—Export copper closed around 9.75c, c.i.f. European ports, a new low since Feb. 15. While all producers held prices unchanged here at 10.00c, Connecticut, for electrolytic, a limited tonnage of resale metal was available at 9.87½c. The daily sales rate slumped to below 225 tons after mid-week.

Lead—The domestic market appeared unaffected by the ¼-cent decline in zinc. Clinton H. Crane, chairman of St. Joseph Lead Co., said at the current rate of lead consumption in industry the present price is justified and that if the country is to use more lead prices will be higher. Sellers continue to quote on the basis of 4.50c, New York.

Zinc—Following publication of the February statistical report showing a further increase of $19,606 tons in total stocks, prices dropped $5 per ton on Wednesday to the basis of 4.50c, East St. Louis, and 4.85c, New York, for prime western. The decline may hasten the closing of additional marginal mines leading to a balance between production and shipments.

Tin—Straits tin prices held unusually steady early in the week on dull buying but weakened later in the week, closing around 40.87½c on spot.

Antimony—Chinese and American spot held unchanged at 15.87½c and 13.75c, respectively. Buying interest was lacking.

Capacitor Prices Reduced

■ Reductions as much as 18 per cent in prices of capacitors have been made by General Electric Co., Schenectady, N. Y. On the 2300-volt, 15-kva capacitor the reduction is 10 per cent and on the 4600-volt and 6900-volt 15-kva units it is 18 per cent. This brings the average prices of this equipment to less than 40 per cent of the 1929 level, resulting from improved manufacturing methods and use of new and improved materials.

A comparable reduction in size and weight has also been effected since 1929. In 1929 the 2300-volt, 15-kva capacitor weighed 135 pounds, today 47 pounds.

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Equipment

Boston — Heavy foreign orders, notably from Russia, with Japan and England following closely, have been widely distributed among New England machine tool builders with indications substantial volume from abroad will be placed well into this year. Export buying has gone far toward filling the gap caused by the decline in domestic demand. Some Worcester builders of grinders are still asking 10 weeks for delivery to domestic customers. Export volume is widely distributed as to metalworking lines. There has been an upturn in government buying with several New England builders taking orders recently, including Brown & Sharpe Mfg. Co., Providence, R. I., and Heald Machine Co., Worcester, Mass. One district engineering interest closely identified with steelworks equipment reports 11 projects held up on which estimates have been taken or asked.

New York—Industrial inquiry and buying of machinery is slack. While purchases for federal government shops and departments are substantially higher, such orders fail by far to offset the lag in manufacturing demand. Private plants are buying only what is urgently needed. Some machinery builders have booked heavy foreign orders and have large backlogs. Except for heavier equipment backlogs of domestic bookings are nearing an end at many plants and shipments against such volume will be about completed next month by some builders. Those with export orders will carry on at a relatively high rate. Builders of boring mill machinery, heavy planers and large units still have domestic orders under way for shipment through July. Dealers are not benefitting much from the foreign orders which generally are placed direct. Victor R. Browning & Co., Willoughby, O., has been awarded a 100-ton electric overhead bridge crane for the Washington, D. C. navy yard at $34,990.

Chicago — Machinery sales still lag. A fair volume of business is pending, but closing on many items is deferred by general business uncertainty. The decline in backlogs of machine tool builders, as indicated by improvement in delivery promises on new business, is tempered to a certain extent by export sales, but production is receding. The railroad freight rate increase offers but little promise of any marked gain in machinery purchases for car and locomotive shops.

Construction and Enterprise

New York

FULTON, N. Y. — City council is preparing plans for sewage disposal plant. Cost $200,000 to $400,000. G. W. Hackett, Fulton, city engineer. Plans will be submitted to PWA for approval.

LITTLE FALLS, N. Y. — City plans constructing sewage disposal plant to end pollution of Mohawk river. Cost $150,000. Maturity indefinite pending financing. R. Austin, city engineer.

NORTH TONAWANDA, N. Y.—General Plastic Inc. plans erecting building addition for manufacturing synthetic phenol under a process developed in Germany. Cost $500,000.

THIELLS, N. Y. — New York state department of mental hygiene, state office building, Albany, takes bids to March 30, for constructing water supply plant and filtration plant for village of Letchworth. Cost $180,000. T. F. Farrell, department of public works, Albany, chief engineer.

UTICA, N. Y. — City plans applying to WPA for grant to assist financing constructing sewage treatment plant. Cost $750,000. J. B. Shaw, city engineer. (Noted in STEEL, Jan. 17, 1938).

Pennsylvania

PHOENIXVILLE, PA.—Borough, N. G. Young, borough hall, soon takes bids for constructing sewage works and pumping station. Cost $500,000. Albright & Friel, 246 South Fifteenth street, Philadelphia, engineers.

Ohio

LORAIN, O. — City plans improvement and expansion of waterworks system, including elevated storage tank and pump. Cost of tank, $110,000; cost of pump, $25,000. P. Mikers, Lorain, director of public service.

WRIGHT FIELD, DAYTON, O.—War department, air corps, takes bids to 10 a.m., March 18, for five 12-16-volt electric motors, tow target windlass, in accordance with specifications 32154 dated Jan. 28, 1938; delivery Wright field.

Michigan

BRIGHTON, MICH. — City will hold election April 2 to vote on $75,000 bonds for sewerage system and sewage treatment plant. Ayres, Lewis, Norris & May, Ann Arbor, engineers.

DOWAGIAC, MICH. — Ayres, Lewis, Norris & May, Ann Arbor, engineers, have completed plans for constructing electric generating, power and distribution system for the city. Cost $200,000.

KALAMAZOO, MICH. — Consumers Power Co., Jackson, Mich., has approved plans for new addition to generating station at Kalamazoo. Estimated cost with equipment $300,000. Work scheduled to begin soon. (Noted in STEEL, Jan. 24, 1938).

LANSING, MICH.—Application for WPA funds for constructing municipal water-conditioning plant has been authorized by the Lansing board of water and electric light commissioners. Cost about $500,000.

LEXINGTON, MICH.—Construction of municipal water plant system will be started as soon as weather permits. Grant H. Smith, village president. Cost $34,500. (Noted in STEEL, Feb. 14, 1938.)

MONTROSE, MICH. — City is making plans for new water supply system with ground supply pump and distribution lines. Cost $32,000. Francis Engineering Co., 255 Eddy building, Saginaw, engineer.

UBLY, MICH. — First line construction contracts for 1500 miles power lines for Thumb Electric Co-operative association, Ubly, will be completed this week. Total cost of power lines more than $900,000. Cost of entire project $2,000,000.

ZEELAND, MICH.—Preliminary plans for constructing municipal sewage disposal plant have been drawn up by Ayres, Lewis, Norris & May, Ann Arbor, engineers. Cost $80,000.

Illinois

CLARENDON HILLS, ILL. — Jordan Co., 2630 West Arthington avenue, Chicago, plans installing motors and controls, conveyors, regulators and other equipment in new chemical manufacturing plant, vicinity of Clarendon Hills where company has acquired 80-acre tract on Chicago avenue. Plant will have 22 units including powerhouse. Cost about $350,000. N. Ronneberg Inc., 10 South LaSalle street, Chicago, architect and engineer.

CRYSTAL LAKE, ILL. — City is making plans for sewage disposal plant. Edwin Hancock Engineering Co., 1509 West Jackson boulevard, Chicago, engineer. (Noted in STEEL, Feb. 21, 1938).

Maryland

LEONARDTOWN, MD.—City will construct sewage disposal plant and sewerage system. WPA project with $20,000 available. Dr. Eugene Peck, county health officer.

Kentucky

LEXINGTON, KY. — Lexington Water Co. plans $203,000 plant improvements.

LOUISVILLE, KY.—Louisville Water Co., L. S. Vance, chief engineer and superintendent, receives bids March 28 for designing, manufacturing, transporting and erecting two vertical-shaft electric-driven centrifugal pumping units, each having capacity of 30,000,000 gallons in 24 hours against 200 foot head; also certain appurtenances to be installed at River pumping station. Alvord, Burdick & Howson, 20 North Wacker drive, Chicago, Ill., engineers. (Noted in STEEL, Feb. 21, 1938).

LOUISVILLE, KY.—Louisville Gas & Electric Co., 311 West Chestnut street, plans constructing substation at Breckenridge and Dutchman's lanes near Taylorville road. Cost $98,625. Private plans.

VANCEBURG, KY.—City, J. A. Hallsted, clerk, plans municipal light and power plant. $148,000 bonds approved. Maturity in spring. H. N. Herrman, 3946 Ledgewood drive, Cincinnati, engineer.

District of Columbia

WASHINGTON — General purchasing officer, Panama canal, takes bids to 10:30 a.m., March 17, schedule 3337, for locomotive crane boiler, track bolts, water pipe fittings, crucibles, screw jacks, twist drills, auger bits, reamers, taps, files, wrenches, saws, hammers and hatchets, delivery Cristobal or Balboa, Isthmus of Panama, Canal zone.

WASHINGTON—Navy department, bureau of supplies and accounts, takes bids March 15, schedule 2889, for cylinder valves, delivery Norfolk, Va., and Mare Island, Calif.; schedule 2895, for steel forgings, delivery Newport, R. I.; schedule 2901, for steel forgings, delivery Newport, R. I.; schedule 2908, for horizontal boring, milling and drilling machine, delivery Puget Sound, Wash.; schedule 2915, for motor-driven keyway cutter machine, delivery Mare Island, Calif.; schedule 2921, for rough-machined steel forgings, delivery various east and west coast points; schedule 2925, for pressure relief valves, delivery Portsmouth, N. H.

WASHINGTON—Navy department, bureau of supplies and accounts, receives bids to 10 a.m., March 18, schedule 2997, for motor-driven precision bench lathe, delivery Submarine Base, Conn.; schedule 2981, for steel forgings for shafting, delivery Brooklyn, N. Y., and Philadelphia; schedule 2982, for steel castings, delivery Newport, R. I.; schedule 2967, for upright, sensitive, motor-driven drills, delivery various east and west coast

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points; schedule 2954, for portable, gasoline, motor-driven pumps, delivery various east and west coast points; until 10 a.m., March 22, schedule 2988, for heavy duty motor-driven engine lathe, delivery Mare Island, Calif.; schedule 2989, for motor-driven, hand-operated screw machine, delivery Keyport, Wash.; schedule 2990, for corrosion-resisting steel plate, delivery Mare Island, Calif.; schedule 2995, for 720 feet insulated electric cable, delivery various east or west coast points.

Massachusetts

LYNN, MASS. — Lynn Gas & Electric Co. plans early rebuilding of coal-handling plant on waterfront recently damaged by fire, including 300-foot coal loading tower and conveyor, coal-lifting machinery, and other equipment.

Florida

BUSHNELL, FLA.—REA has allotted $166,000 to Sumter Electric Co-operative association to build 170 miles of lines in Sumter, Lake Marion, and Hernando counties. In addition $34,000 allotted to install generating plant near Bushnell.

KEYSTONE HEIGHTS, FLA.—Clay Electric Co-operative Association Inc. has $163,000 REA allotment to build 143 miles of line in Alachua, Bradford, Clay, Putnam and Union counties. Allotment included $30,000 for purchasing distribution from Keystone Power & Light Co. and $42,000 to rehabilitate and add to a generating plant in Keystone Heights.

Mississippi

COLUMBUS, MISS.—City council directed Beard Engineering Co. to proceed with plans and specifications for distribution system. Will use TVA power. (Noted in STEEL, Feb. 21, 1938.)

JACKSON, MISS.—Southern Bell Telephone & Telegraph Co., Hurt building, Atlanta, Ga., applied for permit to construct $90,000 exchange building, Lamar and Capitol streets. Will install entirely new equipment. Hentz, Adler & Schutze, Candler building, Atlanta, Ga., architects.

NATCHEZ, MISS. — Armstrong Rubber Co. Inc., West Haven, Conn., plans installing motors and controls, conveyors, regulators, transformers and power substation equipment, electric hoists and other equipment in new mill at Natchez for producing automobile tires for Sears, Roebuck & Co., Chicago, which will be active in project and help with financing. Buildings will be erected by municipality and occupied under long-term lease. Cost $1,500,000. (Noted in STEEL, Feb. 21, 1938).

North Carolina

MEBANE, N. C. — Local government commission, Raleigh, approved issuance of $40,000 sewage disposal bonds.

TARBORO, N. C. — Edgecombe-Martin County Electric Membership Corp. has REA allotment of $110,000 to build 107 miles rural line in Edgecombe, Martin and Pitt counties.

South Carolina

COLUMBIA, S. C.—L. W. Busbee, Columbia, introduced bill in house of representatives to create commission to erect hydroelectric power plant on South Edisto river, near Black's crossing between Williston and Springfield in Orangeburg, Aiken and Barnwell counties. To be known as tri-county hydroelectric commission. Surveys to cost $15,000. Commission will apply for $2,000,000 funds.

SPRINGFIELD—Tri-county hydroelectric commission plans hydroelectric plant between Williston and Springfield to serve Aiken, Orangeburg and Barnwell counties. Cost $2,000,000. Engineer not yet appointed.

Tennessee

CHATTANOOGA, TENN.—Chattanooga electric power board requested city to authorize issuance of $2,382,000 bonds which PWA has agreed to purchase. Money to be used for constructing electric distribution system.

CLARKSVILLE, TENN. — Cumberland Electric Membership Corp., incorporated with Mayor W. D. Hudson, temporary chairman, will construct rural distribution lines in seven counties. Thomas H. Allen, 65 McCall street, Memphis, Tenn., engineer.

MEMPHIS, TENN.—Willard Storage Battery Co. has permit for constructing plant at Chelsea and Highland. Cost $100,000.

Louisiana

BOSSIER CITY, LA.—City, H. L. Fuller, mayor, may vote on bonds for constructing light plant. Garrett Engineering Co., 408 Hughes street, Houston, Tex., is engineer.

PLAQUEMINE, LA. — City, Gladys Baist, clerk, receives bids March 15 for furnishing machinery, foundation services and equipment for electric light plant.

RUSTON, LA.—Town, Charles C. Goyne, mayor, L. J. Voorhies, consulting engineer, City hall, Baton Rouge, receives bids March 29 for constructing sanitary sewage disposal plant. Work divided into following sections: Section A, sewage pumping equipment; section B, Venturi meter; section C, rotary sewage distributors and siphons; section D, chlorinating equipment; section E, general contract.

Virginia

ALEXANDRIA, VA.—John W. Howard, division manager, Virginia Public Service Co., begins construction soon on addition to Jefferson street substation, which will increase capacity to 15,000 kilowatts. Cost $50,000.

Missouri

LA PLATA, MO. — City will take bids soon for constructing municipal power station and electric distribution lines. Cost about $97,300. Financing through federal aid. E. T. Archer & Co., New England building, Kansas City, Mo., consulting engineer.

Oklahoma

FAIRFAX, OKLA.—City plans purchasing 100-horsepower diesel oil engine for pumping water. P. Beaty, mayor.

Wisconsin

LA CROSSE, WIS. — E. G. Doudna, secretary, board of regents, Madison, closes bids March 22 for furnishing boilers, stokers, coal-handling equipment, and radial brick chimney for new $100,000 central heating plant at state teachers' college here.

MADISON, WIS. — State highway commission has rejected all bids for constructing new highway laboratory, sign shop and service building as exceeding legislative appropriation of $175,000. Plans will be revised and new bids asked soon. E. L. Roettiger, chief engineer.

MOSINEE, WIS.—Consoer, Townsend & Quinlan, engineers, 205 West Wacker drive, Chicago, submitted report to village for intercepting sewers and sewage pumping plant. Cost $65,000.

Minnesota

CAMBRIDGE, MINN. — City, S. R. Bronniche, city clerk, is making a survey to determine feasibility of constructing municipal light plant. Estimated cost $120,000.

Texas

GROESBECK, TEX. — City, J. Brad-

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ley, mayor, is taking bids for waterworks system improvements, including 150,000-gallon elevated tank and 600,000-gallons-per-day filtration plant. Cost $80,000. Hawley, Freese & Nichols, Capps building, Ft. Worth, engineers. (Noted in STEEL, Oct. 18, 1937).

HENDERSON, TEX.—Rusk County Electric Co-operative Inc., C. A. Dawson, president, receives bids March 18 for furnishing materials, labor and constructing rural electrical distribution system approximately 122 miles long in Rusk and Panola counties. Cost $100,000. William G. Morrison, 912 Professional building, Waco, REA engineer.

HOUSTON, TEX.—Houston Lighting & Power Co., Houston, will spend $2,876,664 in 1938 for new construction and improvements in addition to $845,388 for maintenance of present facilities; about half that amount will be spent for installing 25,000-kilowatt turbine at Gable street plant. Company plans spending $1,450,000 on this installation in 1938 and $550,000 in 1939. Program includes improvements and extensions of power stations at cost of $1,549,963; expansion of distribution facilities, $685,045; expansion of transmission facilities, $109,000; expansion of substation facilities, $101,656; new meters, $175,000; new transformers, $100,000; rural extensions $75,000; and miscellaneous, $28,500.

MONAHANS, TEX. — City, E. A. Hill, mayor, is making plans for waterworks, including distribution lines, deep well and pumping equipment, fire plugs, tank and tower. Cost $35,000. Koch & Fowler, Great National Life building, Dallas, engineers, and care of city engineer.

PARIS, TEX.—M. E. Boaz, Brookston, secretary-treasury, Lamar county committee, interested in constructing rural electric distribution system in Lamar and Red River counties. Applied to REA for $285,000 funds.

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Kansas

OLATHE, KANS.—City, W. K. Tainter, clerk, has approved constructing primary pump line with pump and pumping station.

North Dakota

MANDAN, N. DAK. — City, S. E. Arthur, city auditor, is taking bids to 3 p.m., March 26, for three deep well turbine type pumps; one dry feed machine; one horizontal type centrifugal pump; one chlorinator; one gas scrubber, two vacuum type gas pumps; slow mix equipment; and four filter control tables. Plans obtainable from E. R. Griffin, city engineer. E. L. Lium, 913 Almonte, Grand Forks, consulting engineer.

South Dakota

CENTERVILLE, S. DAK. — City, W. L. Disbrow, city auditor, has applied to WPA for funds and will hold special election on bond issue to finance constructing sewage disposal plant. Estimated cost $30,000.

VERMILLION, S. DAK. — Clay-Union Electric Corp. of Burbank, Lloyd B. Ellison, secretary, is drawing up plans for constructing an additional 100 miles rural transmission lines to serve 150 customers. Buell & Winter Engineering Co., 508 Insurance Exchange building, Sioux City, Iowa, consulting engineer.

Iowa

KEOSAUQUA, IOWA—City, P. F. Earl, clerk, has appointed a committee to work out details for constructing new sewage disposal plant and new sewer system.

SIOUX CITY, IOWA—Agrol Chemical foundation, Atchison, Kans., plans erecting plant here. Cost $500,000.

Nebraska

COLUMBUS, NEBR.—Board of directors, Loup River Public Power District, has approved constructing 123 miles rural transmission lines in Colfax county. Cost $110,795. Application has been submitted to REA for final approval. Harold Kramer, district secretary. (Noted in STEEL, Jan. 10, 1938.)

HASTINGS, NEBR. — Central Nebraska Power and Irrigation District, R. O. Canaday, secretary, Third and St. Joseph avenue, is taking bids to 11 a.m., March 22, for furnishing four 13,000-horsepower vertical shaft Francis turbines with incidental items; three actuator type governors connected on twin system; and one 25,000-horsepower vertical shaft Francis turbine. George E. Johnson, Hastings, chief engineer and general manager. Delivery as per specifications obtainable from secretary.

WAYNE, NEBR.—City, M. L. Ringer, mayor, will take bids soon on constructing sewage disposal plant on which WPA aid has been assured. Cost $50,000.

WAYNE, NEBR. — Wayne County Public Power District has appointed H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, as consulting engineer. Survey is being made to determine miles of transmission lines to be built and cost of construction. Application will be made for REA loan.

Montana

MISSOULA, MONT. — Congressional appropriation insures constructing pumping plant on Flathead irrigation project, where $200,000 preliminary work is being completed. Cost of pumping plant $500,000.

Pacific Coast

LOS ANGELES—A certificate to conduct business under the firm name of Rex Oil Tool Mfg. Co. at Santa Fe, Calif., has been issued to the owner, Sarah J. Friller, 546 North Milton avenue, Whittier, Calif.

LOS ANGELES, — Alberty Welding & Machine Engineering Corp. has been incorporated here with $25,000 capital stock. Louis F. Alberty, Edward O. Williams, George C. Davidge, incorporators. Loeb, Walker & Loeb, representatives.

LONGVIEW, WASH. — If suitable power rates cannot be obtained from private sources, REA is ready to provide funds for constructing diesel power plant for the Cowlitz County Public Utility District. Ben C. Creim, REA engineer, Washington, D. C., conferred with commissioners of local district.

SEATTLE — WPA funds totaling $112,000 have been granted for five water system improvements in the state of Washington, including $16,712 for Olympia, $37,463 for project at Milton, $71,000 for project at Yakima, and $84,000 for project at Lowell.

Canada

ST. JOHN, N. B.—Ford Motor Co. of Canada is erecting a new maritime headquarters building. Cost $225,000.

BUENA VISTA BAY, N. F.—Lloyd Sales Co., Ltd., 121 Queen Victoria street, E. C., London, England, plans sulphate pulp mill, capacity 226 tons daily. Cost $6,000,000. Engineer, care of owner, engineer.

HAMILTON, ONT.—The Steel Co. of Canada is erecting a new benzol recovery plant to replace the one recently damaged by fire. Cost $250,000.

PETERBOROUGH, ONT. — Western Clock Co. Ltd., Hunter street east, plans replacing boilers during summer. Cost $50,000.

MONTREAL, QUE.—British American Oil Refineries is building an addition to its oil refining plant. Cost approximately $500,000.

QUEBEC, QUE.—National syndicate of Quebec, care of S. A. Baulne, president, Montreal, was authorized by provincial government to build two or more central electric power plants in Abitibic and Temiskaming districts. Cost $10,000,000. Government also plans to allow construction of other plants where needed.